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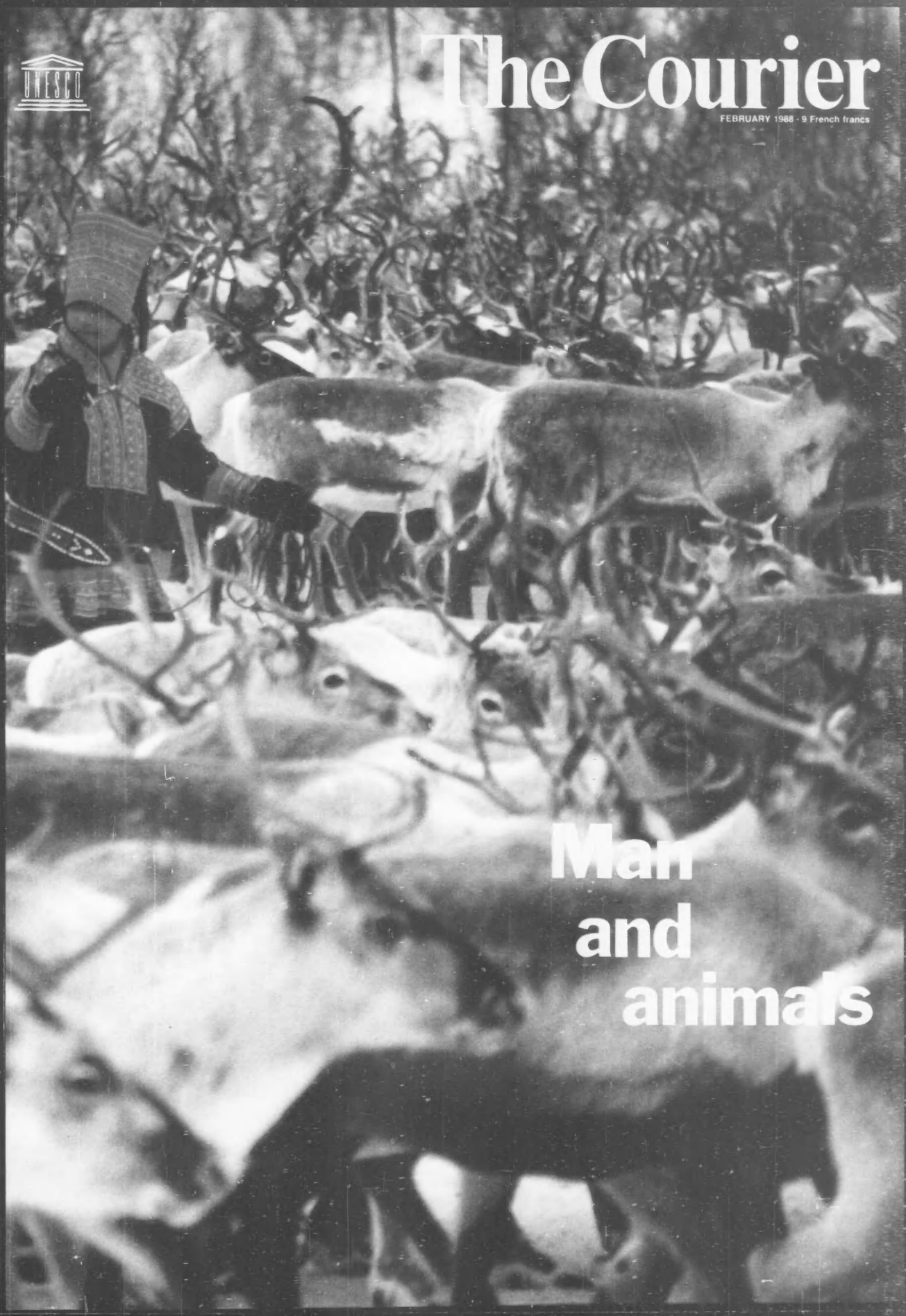

Man and animals

Hitting the high notes

Below, some of the prize-winners at the seventh pan-African song contest, "Découvertes", which was held in Yaoundé (Cameroon) in 1987. Contestants from many countries take part in this annual event, organized by Radio France Internationale and over 60 radio stations of Africa and the Indian Ocean. The art of song is one of many forms of creative expression that the United Nations World Decade for Cultural Development (1988-1997) seeks to promote.

2 ***Cameroon***

Photo Guy Le Querrec © Magnum, Paris

Editorial

All human societies, past and present, have coexisted with populations of animals of one or many species. This issue of the *Unesco Courier* explores some of the many dimensions of the relationships which have arisen from this coexistence at different times and in different cultures. The articles on the following pages may raise more questions than they answer, since human attitudes to the animal world have been so diverse, and so often replete with mystery, paradox and ambiguity. The very question "What is an animal?" produces answers which differ from one culture to another, and definitions of animality, whether "folk" or "scientific", reveal much about the ways in which the definers see themselves. The lovable animal of one culture may be the unwanted pest of another. Modern industrial society may seem no stranger to ambivalence in this field when it lavishes affection on pets yet tolerates the cruelty of intensive forms of conveyor-belt husbandry. And even when modern man is most seemingly benign to his fellow creatures, his activities have such a far-reaching impact on the environment that the survival of many animal species is being jeopardized by the destruction of their habitat.

The earliest surviving record of the man-animal relationship can be found in prehistoric rock art. Creation myths of some early societies speak of a golden age when "gods, animals and people lived together and communicated as equals in a common language", perhaps reflecting a balanced and in a sense almost egalitarian relationship between hunters and animals. Such societies killed what they needed to survive, and usually did not exceed the capacity of the environment to replenish the resources they had taken. Then came a revolutionary change: with the transition from hunting to pastoralism and the development of animal husbandry, certain animals were domesticated and came under human control. This was the beginning of a process which still goes on today.

The man-animal relation can be seen from many standpoints. Our species has used animals symbolically to embody a range of qualities, from innocence to dark unruly forces; we have involved animals in religious practices; our feelings about animals have been vividly expressed in the visual arts, literature and folk tales, and in anthropomorphic cartoon animals. Man has studied animals scientifically and used representations of their society in attempts to understand his own; he has explored the boundaries of communication with animals. And while engaging in these multiple activities he has felt a diversity of emotions: fear and admiration, cruelty and affection, familiarity and distance, reflecting a complex relationship varying from friendship to hostility and uneasy truce.

Cover: A Lapp working in a corral with his reindeer herd
Photo Alexander © Rapho, Paris

Back cover (inset): Bronze Age rock carvings at Tanum, Sweden (c. 1500 BC)
Photo Candelier-Brumaire © Artephot, Paris

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Man and animals

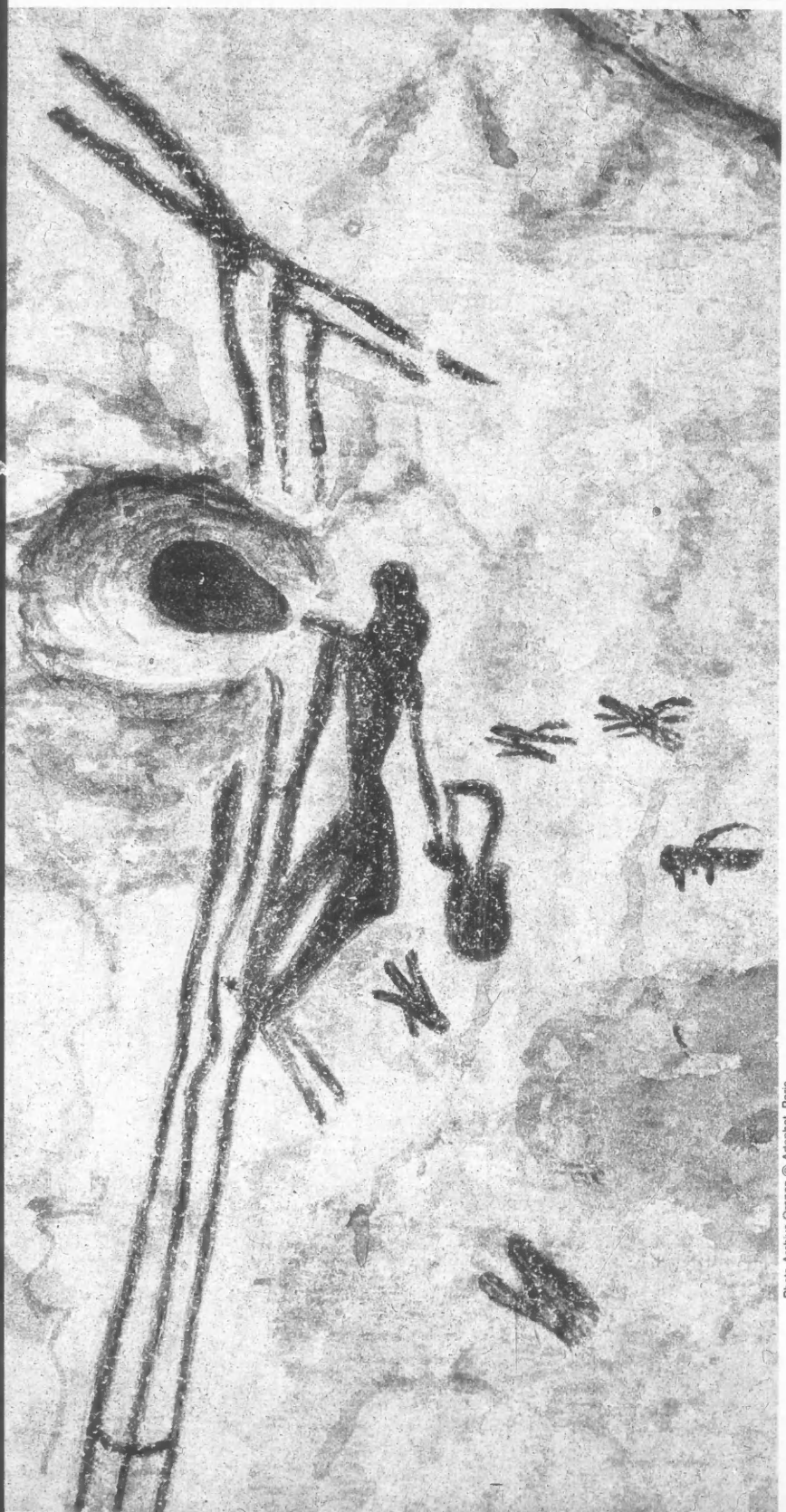

Photo Archivo Oronoz © Artephot, Paris

EACH culture thinks about animals differently and classifies them in ways which define the possible relationships between man and those other species which share his physical and symbolic environment. The modes of classification vary from period to period and place to place, but they usually lead to the differentiation (or to the association within general groups) of human beings, gods, plants, animals, stones, and spirits.

Generally speaking, the natural sciences are not fundamentally distinct from indigenous and popular forms of knowledge; they develop as a result of a continual process of "conceptual tinkering". Thus, in order to distinguish plants from animals and to accommodate organisms which were difficult to classify, in the nineteenth century it was found necessary to create a kind of halfway house or intermediate category, that of the "protists", from which the bacteria were later extracted and assigned to a separate kingdom, that of the procaryotes.

It is almost as difficult to establish a taxonomical difference between man and animals. One specialist, Jacques Goimard, has summed up the problem in these terms: "even the latest scientific thinking, in spite of appearances, has not completely abandoned the attempt to define a specific quality which differentiates animals from plants and, above all, from human beings. The animal might be defined as a non-human. But all attempts to solve this problem are unsatisfactory: none of the proposed criteria is acceptable, except possibly that of upright posture, which is the least metaphysical ... of all." The difference is not biological but essentially cultural and perhaps metaphysical.

The French anthropologist Claude Lévi-Strauss has pointed out that "the Navajo Indians, who proclaim themselves to be 'great classifiers', divide living creatures into two categories, depending on whether or not they have the gift of speech. Beings without speech include animals and plants".

Once the frontiers have been defined, relations can be established and communication can begin.

◀ **A woman gathering honey is depicted in this reproduction of a painting (c.10,000/8000-c.3000 BC) in the Araña cave, near Bicorp, Valencia (Spain). Prehistoric rock art provides the earliest record of man's reactions to the animal world.**

by Marc-Olivier Gonseth

Photo © FAO, Rome

Many of the deities of ancient Egypt had animal forms. One of the oldest was the sky-god, Horus the falcon, who is depicted with a human body in this low-relief carving on the walls of the Nubian temple of Kalabsha. Other sacred animals in ancient Egypt included the ram, the bull, the ape and the cat.

Shamanism and the supernatural

The shamanic experience, in which animals sometimes appear as messengers or intermediaries, may constitute the most profound relationship that a human mind can have with the animal world. The ethnologist Emmanuel Désveaux has described how, among the Indians of Big Trout Lake in Canada, at puberty a child is taken to a remote spot where he settles down alone at the top of a tall tree, on a platform that the Indians liken to an eagle's nest, and fasts for several days. He experiences hallucinations that enable him to make contact with supernatural entities *(opawakanuk)*, which belong to the animate world as it is perceived by the Indian mind, and which to us correspond to real animals, to mythical animals, and to supernatural creatures that haunt the forest. After this initiation, the child adopts towards the different animal species an individual system of rituals which include food taboos, verbal taboos and rituals governing the treatment of meat or bones after consumption.

On these occasions the Indians form relationships which they keep up throughout their lives. They also seek to create others, so that the power they receive from supernatural agencies increases as they grow older. When the men are too old to hunt, they can exercise their specific powers in the community through another ritual known as *kosapashikan* (long-distance sight), in which the Indian summons his *opawakanuk*

Photo © Roger Viollet, Paris

Scene from a fresco in the cultural centre of the Hopi Indians at Albuquerque, New Mexico (USA). It was executed in 1978 by the Indian artist J.D. Medina.

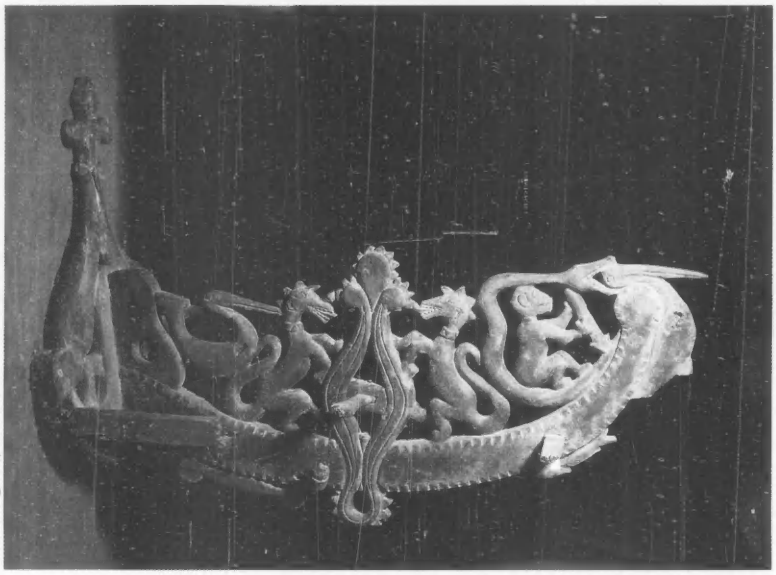

Photo Held © Artephot, Paris

◀ **Richly adorned with animal motifs, this wooden prow of a boat was carved by an artist of the Douala people of Cameroon.**

This tiny bronze figure of a pelican feeding its young is an ornamental weight produced by a metalworker of the Baoulé people of the Ivory Coast. It was once used for weighing gold dust and nuggets. West African craftsmen fashioned a variety of such weights depicting animal figures and scenes. Each one corresponded to an ancient unit of weight based on the seeds of certain plants and was designed to illustrate a proverb or transmit a message. ▶

into a hemispherical shelter and entrusts them with certain missions. This is a "psychic process common to all individuals", and lasts from the earliest initiation to the onset of old age. "In this sense, it can be said that shamanism ... permeates all activities, every moment of the Indians' lives. The *opawakanuk,* essentially animal spirits, are the vectors through which the shaman accomplishes his extraordinary tasks beyond place and time".

Clean and unclean

Pork, which is the object of absolute prohibitions in Jewish and Muslim societies, is a case which illustrates the importance of the classifications which underlie the culture and identity of human groups.

Whether or not a group consumes certain animal species is of fundamental importance. Someone who eats or does not eat a specific kind of meat, in a specific way, in specific circumstances, is often considered an outsider.

In her famous book *Purity and Danger* the British anthropologist Mary Douglas analyses the food prescriptions given in *Deuteronomy* and *Leviticus* and notes that "in general the underlying principle of cleanness in animals is that they shall conform fully to their class. Those species are unclean which are imperfect members of their class, or whose class itself confounds the general scheme of the world". Thus the pig is excluded by Hebrew tradition because, not being a ruminant, it conflicts with the following rule: "Whatsoever parts the hoof and is cloven-footed and chews the cud, among the animals you may eat" (*Leviticus* 11, quoted by Douglas). This prescription also excludes the camel, the rock badger and the hare (which are not cloven-footed). It would be hard to find a clearer instance of the importance of categories of thought in social practices.

Restrictions are also imposed on the eating of pork in societies where it is widely consumed. The reasons given for this are essentially "dietary" and relate to the often deplorable production conditions as well as to latent anxieties about the status of the pig as an omnivorous, scatophagous and supposedly dirty animal.

Animal eaters and animal lovers

The pork processing industry is unfortunately not the only one which sometimes causes concern. The conditions in which other animals than pigs are mass produced for consumption are often scandalous and contrast strongly with the sometimes excessive care lavished on domestic animals.

Another problem is related to the consumption of animal protein, the production of which is extremely costly in terms of energy (it takes between 5 and 20 kg of plant protein to produce 1 kg of animal protein). Levels of consumption vary widely in different parts of the world. Whereas the majority of people do not eat meat or only eat meat on high days and holidays, for a small proportion of the world's population every day is a feast. The adoption of "carnivores" as companion animals is an additional boost to the excessive consumption of meat.

Hunting and rearing animals for their fur, fishing of the great sea mammals, and other examples of the massive exploitation of wild animals by "civilized" man have had spectacular consequences such as the transformation of lakes and forests into aquariums and vivariums, and the increasing rarity of certain species.

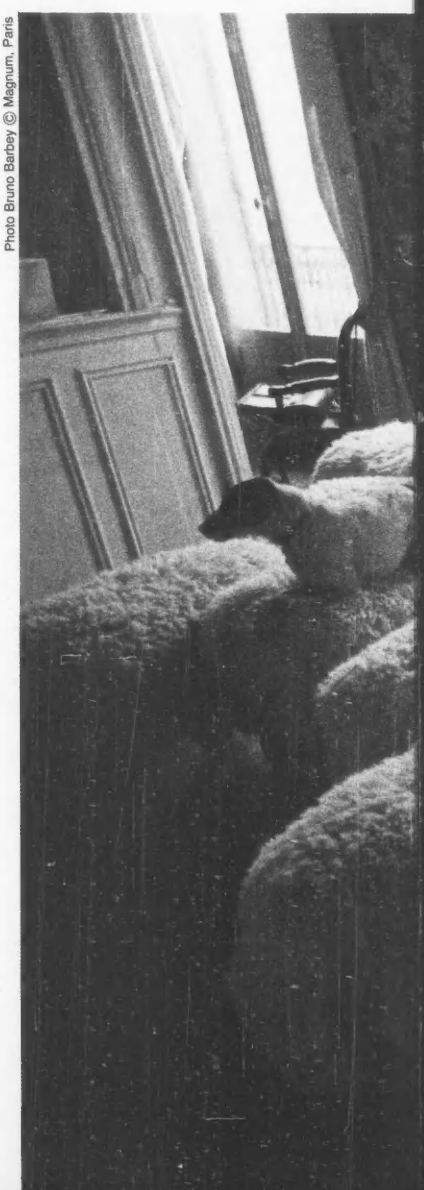

Photo Bruno Barbey © Magnum, Paris

The contemporary French artist François-Xavier Lalanne with his "Flock of Sheep". The work, 6 examples of which were produced, consists of 24 lifesize "sheep" (16 headless). Materials used include copper plating, cast aluminium, wood, steel and sheepskin. ▶

Photo Held © Artephot, Paris

One writer, Philippe Roger, has related the disappearance of animal species to a question of classification which led to the "elimination of animality in the decades between Darwin and Freud". Roger points to the sacred character of all animals as the dominant characteristic of very ancient times, and suggests that it may have been reinforced by Christianity. He notes that medieval bestiaries still emphasize the strangeness of animals and sees the "radiant" animality expressed in the bestiaries as lasting until the time of the eighteenth-century French naturalist Buffon, who himself stressed "the radical difference between the two worlds" by asserting "that man is of a different nature, that he alone is in a class apart".

Unfair game?

Any discussion of the extermination of animals leads inevitably to the question of hunting and its significance. Animals which are highly valued for their fur, skins or ivory are pitilessly and systematically hunted in some parts of the world. The pretexts for expeditions in which risk and the exercise of virility are the backdrop for all kinds of excesses, or decimated in quasi-industrial fashion by groups organized along commando lines, these species are today so seriously threatened that a strict and perhaps partially inoperative regulation has been drawn up to protect them.

The relationship between hunter-gatherer peoples and animals is (or was) generally of another kind. Emmanuel Désveaux tells how, before the arrival of the missionaries, the Indians of Big Trout Lake were each given the name of a different animal species. As a result of this process, a profound relationship could be established between the future hunter and the future quarry. A specific ritual also marked the first capture of a given quarry.

The practices described above are far from being universally accepted, and various organizations and individuals have

Photo P. Ward © ANA, Paris

◀The anthropomorphic rodent Mickey Mouse is one of the most famous animated cartoon characters created by the American film-maker Walt Disney (1901-1966). He made his film debut in *Steamboat Willie* (1928), the first animated cartoon with sound, and later starred in over a hundred short productions. Left, a Mickey Mouse figure takes part in a Washington, D.C., parade.

contributed to the debate on the protection of animals, again raising the question of where the frontiers of humanity should be drawn. Jurists are also being asked to give their opinion on animal rights and to formulate legal provisions for the protection of animals. Which animals should be protected and to what extent? How can human beings be persuaded or forced to respect measures for animal protection?

Man-animal projections

Projections of human characteristics onto animals and vice versa have given rise to two apparently contradictory ways of thinking. The first is that adopted by Walt Disney and other creators of cartoon animals whose attitudes, reasoning powers, attributes, anxieties and preoccupations are unequivocally human. Perhaps this massive output of anthropomorphic perceptions and projections has further confused our thinking about the relationship between man and animals. Urbanization and the industrialization of agriculture have disrupted the relationship between man and animals and led to totally different portrayals of the latter.

The reverse form of projection, from animal to man, is often misused by scientific and popular ethology (life is a jungle, man is wolf to man, the strongest devour the weakest, the female is subjected to the male ...)

Here again we encounter demarcation problems. Colette Guillaumin notes that "if a common animal nature makes it possible to make man, whenever the need arises, by turns a chimpanzee, a wolf or a Scotch grouse, no attempt is made to explain the wolf in terms of the grouse or the chimpanzee in terms of the wolf. This reveals at least one thing: ethology *describes* the animal but *explains* man. The reference point is man and not animal social behaviour as such: the animal is the mask that conceals, albeit inadequately, the project of justifying ... man. ... In spite of appearances, we are not so far from the universe of La Fontaine or Aesop, incapable of not projecting our 'passions', of not peopling the world with constructions engendered by our relations with each other".

This remark seems particularly relevant to species that are close to man (biological proximity in the case of mammals; analogical proximity in the case of social insects), but the further one goes from the human, the less possible the transfer.

Experimentation with animals rests in many cases on the same difficulties of transposition, since man is the only guinea pig on whom medicines destined for his fellows can be reliably tested.

There is one field in which the animals we think of as wild and even ferocious still enjoy a little autonomy: in our individual or collective fantasies and in the stories in which they feature, wolves, tigers and hyenas join the hybrids and monsters of our imagination—dragons, centaurs, werewolves, yetis and other "alien" creatures—to define the imaginary limits of our humanity.

Perhaps we have lost our feeling for the "right distance" between ourselves and animal species, a distance that can enable us to communicate with animals without oversensitivity or cruelty and can at the same time stimulate our symbolic imagination. By coming too close to certain species, by scandalously exploiting others, and by rejecting animals which are hard to accept in the sanitized capsules in which we live, could we be fomenting dangerous problems in our own minds and in the world at large? ■

The above article has been adapted from Des animaux et des hommes *("Animals and Man"), a book published by the Museum of Ethnography, Neuchâtel (Switzerland) as a commentary on an exhibition with the same title which was held at the Museum in 1987. In the last thirty years the Neuchâtel Museum of Ethnography has won a reputation for its innovative exhibitions. Since 1981 it has presented a series of striking exhibitions designed to stimulate reflection on cultural relativism through the unexpected juxtaposition of artefacts from different cultures.*

MARC-OLIVIER GONSETH, *Swiss ethnologist, was a staff member of the Neuchâtel Institute of Ethnology from 1983 to 1987. He is currently engaged on research among the Ifugao people of the Philippines.*

Grandfather bear

by Viktor A. Shnirelman

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A bear in a sacrificial posture is shown in this buckle from the Urals (4th-5th century AD). In ancient times the hunters of Siberia and North America treated the animals they hunted with great consideration. Before shooting an arrow at a bear, they addressed it in friendly and persuasive tones as "old man", "grandfather" or "lord", and later when it was dead begged it not to take revenge.

Hunting rituals and animal worship in early Eurasian cultures

'FROM the innermost parts of the Earth, from end to end, runs the Myandash-pyrre, the wild reindeer. His track is that of the sun; he runs towards it. He is white, and his coat is more silvery than the snow. He holds his black head high, with his antlers back, and he flies on invisible wings. His breath is that of the untrammelled winds; they bear him along on his flight ..."

In such poetic terms Lapp legends describe the golden-antlered deer, which is a protector and guide. Many of the peoples of Northern Eurasia believed until recent times that their good fortune depended on the spirits that protected animals. The Yakuts thought of a spirit as a fantastic wild beast with the head of a dog, the hooves of a cow, and long ears that hung down. Other peoples believed that success in hunting depended on the good will of the bear that ruled over the reproduction of animals. Others again thought that the world was controlled by two does, from which both wild and domesticated reindeer originated. Another spirit of nature that people believed in was the mammoth, which wandered about under the Earth, heaving it up to produce hills and mounds.

Sometimes these spirits were thought to be cosmic beings. Traces of this belief can still be found among some of the Slav peoples; for instance, the Poles call the Polar Star the "Elk Star", and in the north of the Soviet Union the Great Bear was known as the Elk until a short time ago.

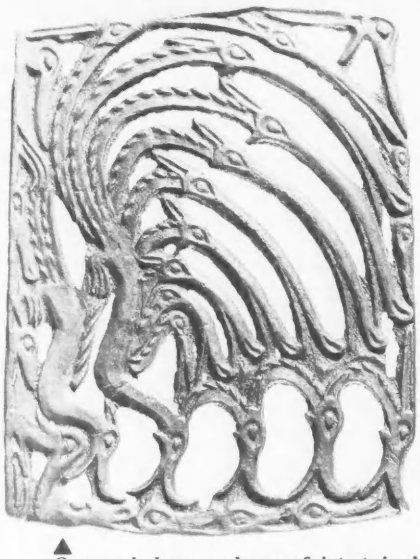
All of this takes us back to the remote past, when nature was peopled with supernatural beings on whose will the fate of human beings depended. Hunters had to pacify the spirits and observe certain prohibitions and prescriptions under the spirits' watchful eyes. Preparations for the hunt were surrounded by mystery. The hunters were allowed to say little about it, and were prohibited from referring to the game they wanted to catch.

The quarry had to be treated with respect. Many of the peoples living in Siberia and North America called the bear "old man", "grandfather", "lord" or "sacred animal". Before shooting a bear, they would speak to it in a friendly fashion, to persuade it not to resist. When the Ostyaks lured a bear out of its lair, they would say, "Don't be angry, grandfather! Come home with us and be our guest." When they had killed the bear they would beg it not to resent their action and take revenge on the hunters. They even tried to escape blame for having killed it.

One Lapp legend tells how the reindeer took pity on hungry men, and suggested that they should kill him. Since then, people had hunted reindeer, and had not wanted for food. But the legend goes on to say that the sacred reindeer had warned men to spare the females and the leaders of the herds in autumn; otherwise the hunting of the wild deer would stop. By controlling their hunting, the Lapps saved these animals from thoughtless extinction, in so doing providing for their own future.

The ancient hunters also believed in certain magical ways of ensuring the fertility of wild animals. Many of the tribes of Northern Eurasia and North America believed it was forbidden to break the bones or the skull of the principal animals they hunted. They carried them into the depths of the taiga, or hung them on trees, believing that this would restore the creatures to life. Others reconstituted the skeleton of a bear they had killed and eaten and, after carrying out certain rites, took it away into the taiga.

But even these precautions did not satisfy the hunters of old, and they called on the shamans, who acted as intercessors with the spirits. It was the shaman's duty to tell people where and when they should hunt or



▲
Openwork bronze plaque of intertwined fantastic animals dates from the second half of the first millennium AD. It was discovered in the region of Perm in the Urals.

Photo © All Rights Reserved

▲
Bronze cult object (5th-10th century AD) from the Perm region is shaped in the form of a man standing on an animal's back.

Photo © All Rights Reserved

fish, and also to treat the sick and forecast the weather.

Each shaman had an animal that was his double; it protected him and was in close contact with him. Many people thought that the shaman was descended from this animal, or had been nurtured by it. He often identified himself with it. Bronze plaques that have been found in the valley of the River Kama and in the Perm region of the USSR, made by metalworkers living in those parts in the period between the sixth and twelfth centuries AD, show the shaman wearing a ritual garment made of animals' skins and birds' feathers.

The shaman sometimes wore a "crown" with a deer's antlers on it, and shoes that were like a deer's hooves. Among the Ostyaks, the shaman-bears had the muzzle of a bear fastened to their brow. On the wolf's festival day, the shamans of the Chukchi wore a mask made from a wolf's muzzle. It was thought that an animal's vital force was in its muzzle, and that the shaman became as powerful as the animal by wearing this sort of mask. When the shaman was in a trance he behaved as if he were an animal—he growled like a bear, leapt like a deer, and so on.

One Yakut legend tells of a shaman who stole the magical hairs of the elk, a divinity that protected wild animals. He strewed the hairs on the tribal hunting ground, and they turned into game. The Nganasan people thought that the Earth Mother was a female elk, and that they had been created from the hairs of her coat.

Among Turkic-speaking nomads, belief in the miraculous powers of animal hair is linked with horses. In their epic tales the *batyr* (a powerful lord, or warrior) often gets out of a difficult situation by setting fire to horse-hairs, which turn into horses. When the horses' hair was clipped, in the spring, the Buryats held a ceremony for the burning of the hair of white horses, which was unquestionably a fertility ritual. When the Tuvinians sold their cattle, they pulled out a few of the animals' hairs and burnt them. In this way they tried to prevent their good luck from leaving them along with the animals.

The war-horse was a favourite figure in Turko-Mongolian epics. It was more than a horse; it had magical properties. It had wings, and could fly through the air; its flight was like that of a falling star. It bestrode the clouds and outstripped the birds; only magic could bring it to a halt. The war-horse played its part in campaigns; it was the protector, guide, counsellor, healer and saviour of its master. Sometimes a mare was the horseman's nurse, and in such cases he was considered to be the foster-brother of his horse. If a *batyr* lost his horse, he lost his strength.

Certain features of the cult of the horse (horses were born from sea-spray and, like winged deer, could fly through the air) suggest that there was once a cult of sacred deer among the ancient Indo-European peoples which, when horse-breeding began, became a cult of the horse. Even today, the motif of a deer's antlers can be seen in the folk art of some parts of Europe. The Celts worshipped a deity which had a deer's antlers, and Artemis, the Greek goddess of the hunt, was shown surrounded by does. A drawing of a winged creature with antlers has been found in a Scythian burial-ground in the Altai region of Siberia.

The transition from the worship of the deer to that of the horse was a slow process, and for a long time the horse was regarded as the reincarnation of the deer. The Hittites and the Celts disguised horses as deer, and according to ancient Vedic documents, Aryan groups decorated the head of a sacrificial horse with the golden antlers of a deer. In the Pazyryk *kurgans* (burial mounds) in the Altai, the remains of horses have been found which have deer masks on their skulls (see the *Unesco Courier*, December 1976). The Scythians put special frontlets on their horses' heads, making them look like deer with winged antlers.

Among the Turko-Mongolian peoples, too, deer were replaced by horses as cult animals. We do not know exactly when and where this took place. But in recent years Soviet archaeologists working in the southern regions of the European part of the USSR have discovered a whole stratum of cultures dating from the fourth millennium BC, when people hunted wild horses and had begun to tame them. About the same time, a cult of the horse grew up, evidence of which can be seen in statuettes of horses and ossuaries of horses' skulls and bones found in ancient settlements and burial grounds. In the same period, in the European steppe, stone sceptres began to be fashioned in the shape of horses' heads, perhaps to symbolize the power of a chief. ■

Costume of a shaman of the Mansi people of Siberia (9th-15th century AD). Details such as the antlers on the headdress evoke the close relationship between the shaman and the animal world.
▼

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People and pets

by Erika Friedmann

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Photo © Edouard Boubat, Paris

PET keeping is virtually ubiquitous among human groups. People have kept domesticated animals for at least 10,000 years, and have captured, tamed and kept wild animals as companions, without breeding them, for considerably longer. Although the initial impetus for domestication is unclear, the first breeding of animals, in the Mesolithic period, was probably associated with favourable environmental changes in specific areas which dramatically increased the availability of food. According to the archaeological records, dogs were the first and cats the second domesticated pets.

The importance of pet animals in modern industrial society is repeatedly demonstrated in the popular press, movies and books. Pets, and dogs in particular, are often characterized as man's "best friend". From a symbolic perspective, pets may well represent the lost relationship of the mother to the infant; that is complete and total devotion, love, and adoration. They can help bridge the developmental transitions from infancy to childhood; from dependence to independence; from isolation to social integration at varying times and stages in our lives. While the relationship between people and their pets may be a symbol for the relationship of a mother to an infant, the species difference constitutes a fundamental distinction, providing emotional continuity without negating our individuality.

Prior to the last decade there were few scientific studies of the benefits of interactions between people and pets. Freud recognized the unique and important role of pets in people's lives: "It really explains," he wrote, "why one can love an animal ... with such an extraordinary intensity; affection without ambivalence, the simplicity free from the almost unbearable conflicts of civilization, the beauty of an existence complete in itself ... that feeling of intimate affinity, of an undisputed solidarity." However, his warm regard for them was not expressed in a clinical interest. Most information about the value of pets to their

people was based upon anecdotal information, compilations of personal stories of the amazing devotion, intelligence and restorative powers of individual pets or particular breeds, without the support of systematic scientific investigation.

In the last ten years the common belief that "pets are good for you" has gained scientific support. Pets decrease owners' loneliness and depression by providing companionship, an impetus for nurturance, and a source of meaningful daily activities. They also decrease owners' anxiety and stress levels by providing contact comfort, a relaxing focus for attention, and a feeling of safety. In addition, a pet can help its owner improve or maintain physical fitness by providing an impetus for exercise. While most researchers into the effects of animals on health have concentrated on dogs, there is considerable evidence that other pets are equally beneficial.

Loneliness may cause or worsen illnesses and can even lead to death, and the company of a pet can promote health by ameliorating the pathological effects of lack of contact with family members or close friends. Pets can be particularly beneficial to elderly people, who are especially vulnerable to loneliness and isolated from their families and friends. They act as companions to their owners, many of whom consider their pets to be family members, talk to them frequently as if they were people, and think their pets are sensitive to their moods.

In the course of a study of the social, psychological and physiological factors affecting the survival of patients with coronary heart disease (severe chest pain or heart attack), pet ownership was related to one year survival. Only three of fifty-three pet owners died within one year of admission to a large urban university hospital while eleven of thirty-nine non-pet owners covered by the study died in the same period. As expected, the best predictor of survival was the severity of the illness. The combination of pet ownership and physiological severity was better at predicting survival than was physiological severity alone. Furthermore, pets benefited everyone, not just those who were living alone, unmarried, or widowed. The researchers concluded that the effects of pets on health were distinct from the effects of other people.

Pets can also lead to increased companionship by facilitating interactions with other people. They provide hospitalized or institutionalized persons with important links to friends and relatives in the outside world. Many pet owners seek daily information about their pets during their own hospitalization.

Frequently people who live alone or lose reciprocity in their relationships with others become depressed, feel unneeded, and lose self esteem. These feelings lead to increases

"In early childhood pets provide a connection to the natural world and are instrumental in teaching respect for other living things." Below, a playful dog and its master dwarfed by a high-rise block in the Paris region.

Photo Salgado © Magnum, Paris

The tradition of keeping domesticated cats as pets is thousands of years old. In ancient Egypt, anyone who harmed a cat was punished and when a pet cat died its master shaved off his eyebrows as a sign of mourning. Below, a modern cat-lover and his companion.

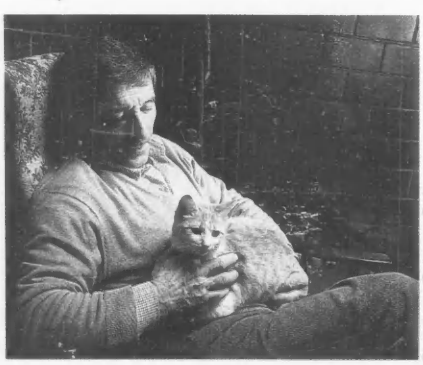

Photo Labat © Jacana, Paris

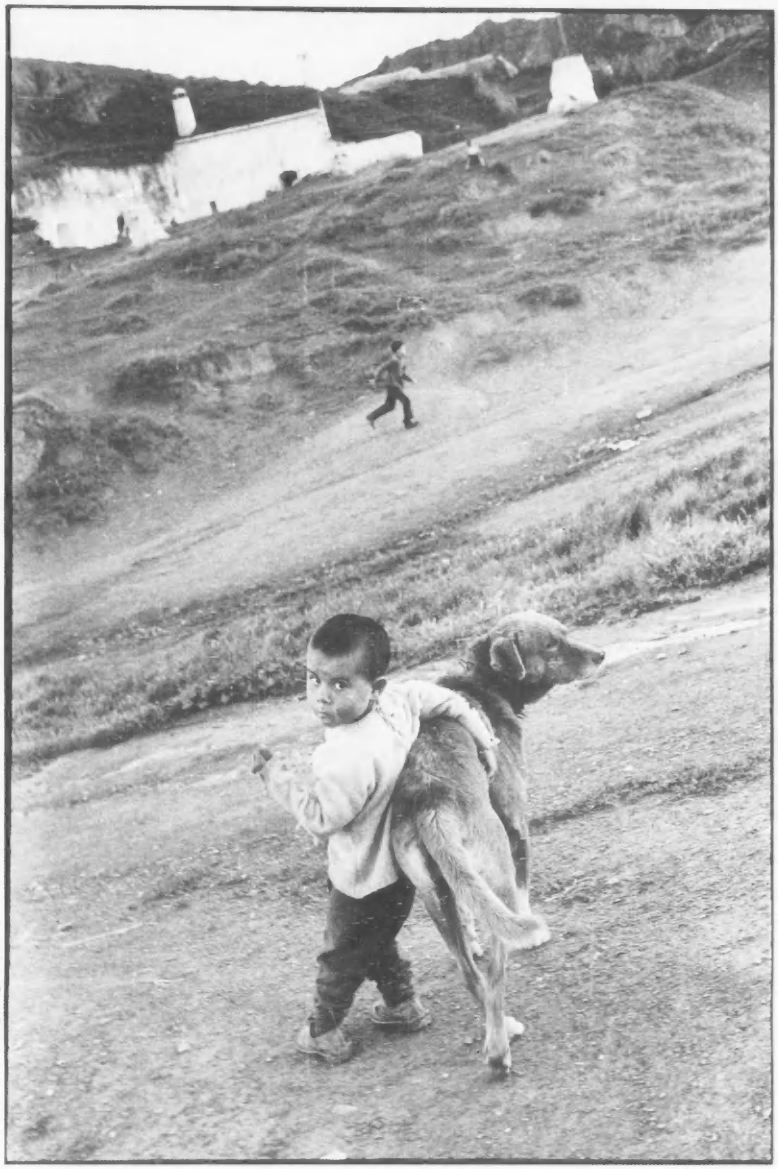

Photo Josef Koudelka © Magnum, Paris

▲ **Above, a young Gypsy and his 4-legged friend. Sometimes thought of as confined to wealthy Western societies, pet-keeping appeals to a wide variety of cultures throughout the world.**

in the psychological and physiological responses to the challenges of daily life which in turn lead to diminution of the body's ability to fight infections and resist disease. By lessening these feelings, pets can decrease the impact of problems, disappointments, deaths of friends, and other stressful events.

Caring for a pet can also improve self image and facilitate caring for oneself. In one survey of senior citizens in the United States, pet owners felt significantly more self-sufficient, dependable, helpful, self-confident and optimistic than non-pet owners. A social worker in Edinburgh (UK) even used the incentive of caring for a pet to induce elderly clients to take better care of themselves. She gave several of her clients, who relied on open fires to warm themselves in winter, pet birds which required warm environments. None of those who were given pet birds and instructed to maintain higher house temperatures for their pets experienced hypothermia that winter. Since hypothermia is a major cause of death for the elderly in Edinburgh, the pets undoubtedly contributed to their owner's health.

There is growing recognition of the important positive role of the sense of touch throughout the human life cycle. Pets provide a crucial source of touch for individuals who would otherwise be without this sensory input. Touching an animal decreases a person's anxiety and stress levels. Touching a pet, as well as being a means of expressing affection, has a beneficial effect on owners' cardiovascular systems. People rarely pet an animal without talking to it, so it is not possible to assess the independent effects of the two activities. Researchers have reported that talking to and petting a companion animal arouse the owners' cardiovascular system less than talking with people. This lends credence to the non-threatening, supportive nature of the bond between humans and companion animals.

Pet animals provide a sense of calmness and security. People may be more willing to go for walks, to leave their homes, or to visit friends when their pet accompanies them or guards their homes in their absence. Recognizing the pleasant aura presented by their inclusion, advertisers and even politicians often use pets to help create desired moods. Both scenes and people in them are perceived as more friendly and less threatening when an animal is included than when no animal is present.

When animals are present, people tend to focus their attention on them, especially in stressful situations. This focus of attention outside the self can cause decreases in stress levels similar to those experienced during more conventional forms of stress reduction such as transcendental meditation or progressive relaxation. Watching fish swim in their tank has been as useful as hypnosis for reducing anxiety and pain during dental surgery. This type of observation of the natural world also can be useful in lowering blood pressure.

Caring for a pet can promote health by giving people responsibility, providing time orientation, and encouraging them to develop a more varied life-style. Taking responsibility for a pet can be especially important to patients whose activities are limited due to chronic diseases, handicaps, or social isolation.

In early childhood pets provide a connection to the natural world and are instrumental in teaching respect for other living things. For slightly older children, the responsibility of a pet may be instrumental in developing self-esteem, self-confidence, and independence.

Pets serve multiple functions at many points in the life cycle from early childhood through mature adulthood. Once contact with an animal is established, it is easier to enter into relationships with other people. ■

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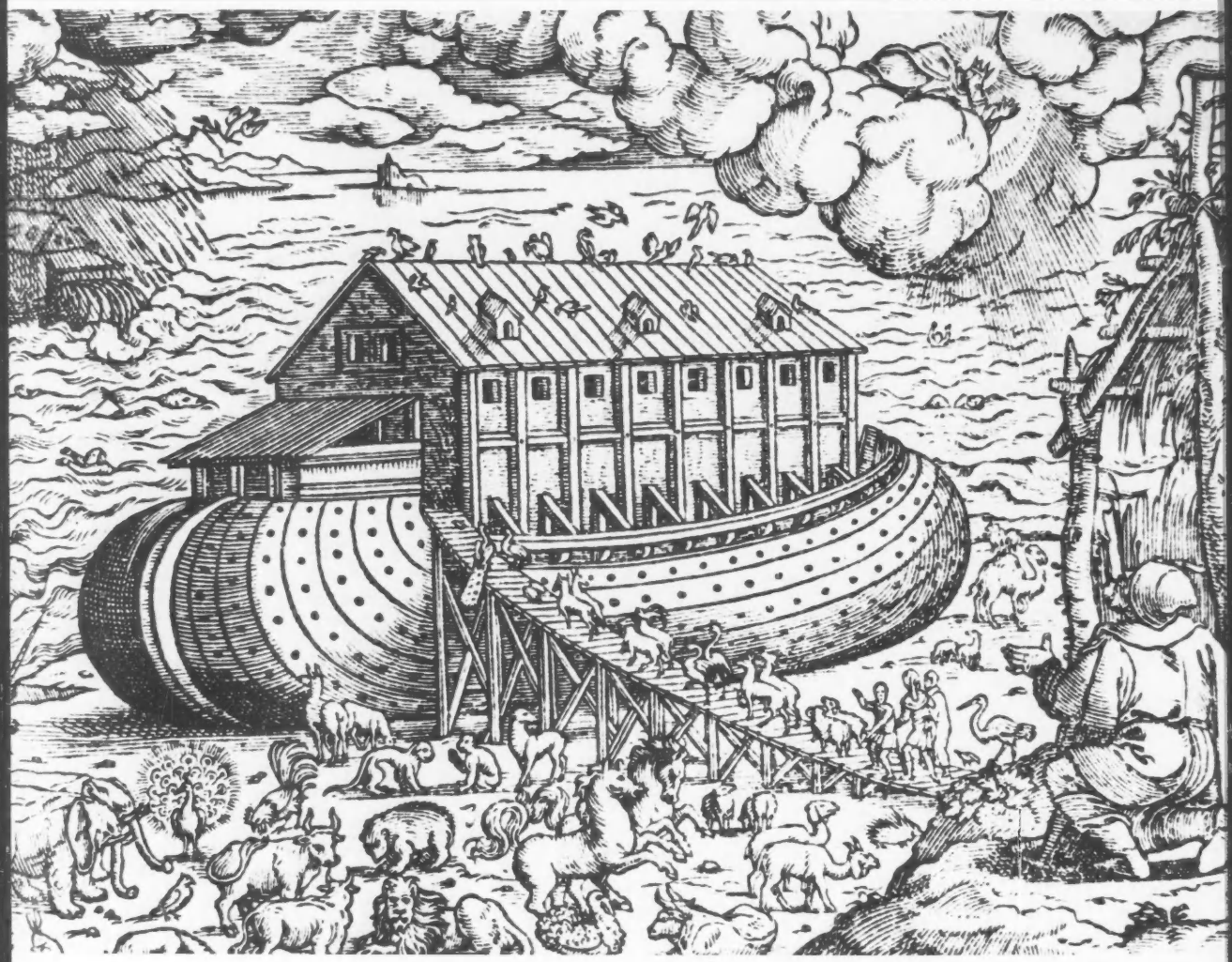
A horse named Hans

by James Serpell



The search for a 'talking animal'

A recent study in the United States revealed that three-quarters of all books and stories written for children are either about animals or contain animals as important central characters. In the vast majority, animals are endowed with essentially human thoughts and feelings and, more often than not, they are able to talk.

Although obvious to anyone who has ever browsed through the average child's bookshelf, these findings are nevertheless intriguing. After all, why should adults writing for children evidently assume that their readers will identify more readily with animal characters than with human ones? And what is the point of encouraging children to imagine that animals can talk when every child will eventually discover that they cannot? At least not in the sense that humans talk. The more one thinks about it, the more curious it seems.

While this notion of animals and people talking to each other is doubtless peculiar, it is far from being a recent or a Western invention. It is older and more widespread than literature itself. The creation myths of indigenous peoples throughout the world hark back to a time beyond memory—a time such as the "dreamtime" of the Australian aborigines—when gods, animals and people lived together and communicated as equals in a common language. Even the biblical account of creation implies a state of harmonious coexistence between Adam and Eve and the non-human denizens of the Garden of Eden. And Noah, we are told, was able to communicate sufficiently well with doves and ravens that he could send them out on search missions.

◀ **"The notion of animals and people talking to each other ... is older and more widespread than literature itself. ... Noah ... was able to communicate sufficiently well with doves and ravens that he could send them out on search missions." Left, Noah's Ark depicted in a woodcut executed in 1564 by the Swiss painter and engraver Jost Amman.**

Long reputed for their intelligence, playfulness and friendliness to man, dolphins are mentioned in the works of Aesop, Herodotus and other early writers, often as a child's mount or the rescuer of someone lost at sea. For centuries many sailors regarded the presence of dolphins leaping around their ship as a sign that their voyage would be smooth and happy. Right: "Cupid astride dolphins", detail from a 2nd-century-BC mosaic on the Greek island of Delos. ▶

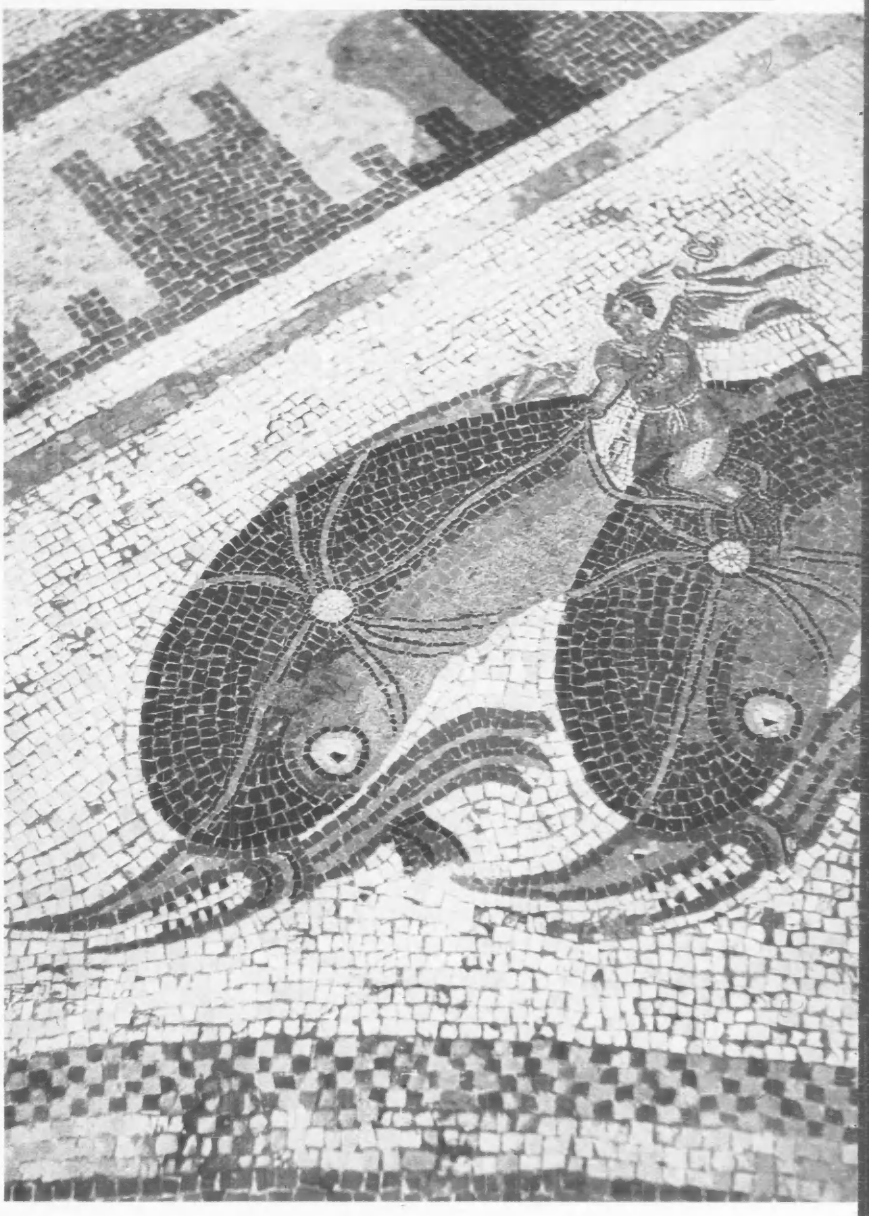


Photo © Roger Viollet, Paris

Photo © Kunstmuseum, Basel

Indeed, as late as the Middle Ages in Europe, the ability to communicate with animals was regarded as a sure sign of budding sainthood. According to legends, many of the early Christian saints possessed a special rapport with the birds and beasts. The nature mystic, St. Francis of Assisi, for example, preached sermons to rapt audiences of birds, and was able to tame wolves, sing duets with nightingales, and still the chattering of swallows or the croaking of frogs. In this modern age of scientific objectivity, such stories seem quaint and fanciful. Yet, ironically, the concept of people talking to animals and vice versa continues to flourish as never before.

The recent revival of interest in such phenomena began with a horse called Clever Hans. Hans belonged to a retired schoolteacher, Wilhelm von Osten, around the turn of the century in Germany. Convinced that his horse was exceptionally intelligent, von Osten decided to teach it to solve simple mathematical problems using the same techniques he had used to teach children. Hans far exceeded his expectations and proved to be exceptionally gifted. When asked to solve a simple problem, for example six subtracted from eleven, the horse would give the correct answer by tapping five times on the ground with his right foreleg. Only rarely did he make serious errors.

Once the news of von Osten's clever horse reached the rest of Europe, Hans became a notable sensation. Visitors poured in to see the horse perform, and most of them went away convinced that Hans was an equine genius. Even those who suspected trickery, including many eminent scientists, were baffled to discover that the horse could still answer people's questions correctly when his trainer was out of sight. His fame spread, and Clever Hans rapidly became a household name.

Sadly, it was not to last. Two professors with the names of Stumpf and Pfungst were determined to prove that Hans was a fraud. They designed a series of experiments, in the first of which two people agreed on a problem they would ask the horse. One of them would whisper the problem in the horse's ear, and then retire from view behind a screen. In this test, where both experimenters knew the right answer, Hans usually solved the problem correctly. In the second test, however, one experimenter thought up a problem without telling the other, and he then whispered it to the horse and retired as before. In this situation, Hans was apparently unable to give the correct answer.

Further investigations revealed that Hans was, indeed, very clever, but not in the way that people had thought. Hans's skill lay in his ability to detect the minute and subtle variations in people's posture and facial expression whenever he solved a problem correctly. To get the right answer, all Hans needed to do was to continue tapping on the ground until he received the appropriate signal to stop from his mystified audience. Everyone, including the disillusioned von Osten, had been fooled because they were unaware that they had been transmitting any signals to the horse (in humans, nonverbal messages of this kind are transmitted unconsciously). They had drastically underestimated the animal's powers of perception and, as a result, had fallen into the trap

of assuming that Hans actually understood the problems he was solving.

In reality, Clever Hans was not particularly exceptional. Talking animals, or at least animals with amazing powers of understanding, had been known about for centuries. Clever Hans was, however, the first such animal to be subjected to detailed scientific scrutiny, and his eventual "exposure" cast a shadow of scepticism over all subsequent phenomena of this kind.

It took the scientific world many decades to recover from this ignominious piece of self-deception and, when news of talking animals resurfaced again in the early 1960s, it involved not horses, but dolphins. It had long been recognized that marine mammals, such as dolphins, were intelligent and highly trainable creatures which could be taught to perform astonishing tricks for public entertainment. But in 1961, a book entitled *Man and Dolphin* was published containing far more exciting observations.

The author, John C. Lilly, was a neurologist who had been conducting experiments on the brains of live dolphins, focusing particularly on their vocal behaviour. Despite early setbacks (many of his experimental animals died under anaesthetic), Lilly succeeded in training dolphins to vocalize on command, and he noticed that some of his animals spontaneously produced passable imitations of human speech. This finding, coupled with the fact that dolphins possess exceptionally large and complex brains, inspired Lilly to make the optimistic prediction that "within the next decade or two" humans would establish two-way communication with another species, probably a marine mammal.

Lilly's book attracted considerable media attention and stimulated a number of futuristic novels and films. More surprisingly, perhaps, his arguments were so convincing that research on human-dolphin communication began to attract considerable government funding. Alas, despite these efforts, Lilly's talking dolphin never materialized. Within a decade it was apparent that the spectre of Clever Hans had simply reappeared in an unfamiliar disguise, and the entire programme of research was discontinued.

Evidently undaunted, the scientific community once again shifted its attention, this time to focus on anthropoid apes. As our nearest living relatives, apes have long been the objects of special fascination, and the idea of teaching them to speak was far from new. The earliest experiments in this direction, conducted by various people between 1896 and the 1940s, were, however, largely unsuccessful. In 1947, for example, a young American psychologist and his wife adopted a month-old infant chimpanzee called Vicki, and brought her up as their "daughter". Vicki was reared as a child for six years until her death, and subjected to an intensive programme of language training. Despite this, she learned only four words—*papa, mama, cup* and *up*—which she whispered rather than spoke. It was concluded that apes were incapable of acquiring human language, if only because they lack the necessary vocal apparatus to pronounce words effectively.

In spite of these early negative results, talking apes hit the headlines again in the 1970s when Allen and Beatrice Gardner at the University of Nevada began teaching a young chimpanzee called Washoe American Sign Language (a system of hand signals devised for the deaf). After four years of intensive training, the Gardners claimed that Washoe had acquired a vocabulary of 132 different signs which she could combine together into apparently meaningful "sentences". Owing to the particularly close relationship which existed between Washoe and her trainers, however, it was difficult to rule out the so-called "Clever Hans effect".

In other words, the Gardners may have unwittingly provided Washoe with non-verbal cues when she gave the correct or expected hand signals. Even when Washoe signalled some spontaneous request, such as "give me drink", it was not clear that she understood the meanings of her signals in a symbolic or abstract sense, as a person would. It was possible that she had simply learned to associate a gesture or a series of gestures with a particular desired result.

These objections to the results of "Project Washoe" and other more recent sign-language studies have led to the invention of increasingly elaborate and sophisticated techniques for exploring the linguistic ability of apes. Artificial languages using coloured plastic chips as "word analogues", and computer keyboards made up of distinctive geometric symbols have been devised to eliminate human interference and the Clever Hans effect. Chimpanzees have even been trained to communicate with each other using such artificial languages.

Studies of this kind have revealed that chimpanzees can be trained to understand, in abstract, the meanings of the symbols they use. In other words, they can acquire

Photo Paul Fusco © Magnum, Paris

◀ **"Chimpanzees can acquire ... the use of arbitrary symbols to represent objects, states or events. As yet, however, research has provided little evidence that they are able to organize these symbols according to recognizable rules of grammar or syntax. In short, their conversational abilities are strictly limited." Left, a chimpanzee learning the hand signal for "tickle" at the Institute for Primate Studies in Norman, Oklahoma (USA).**

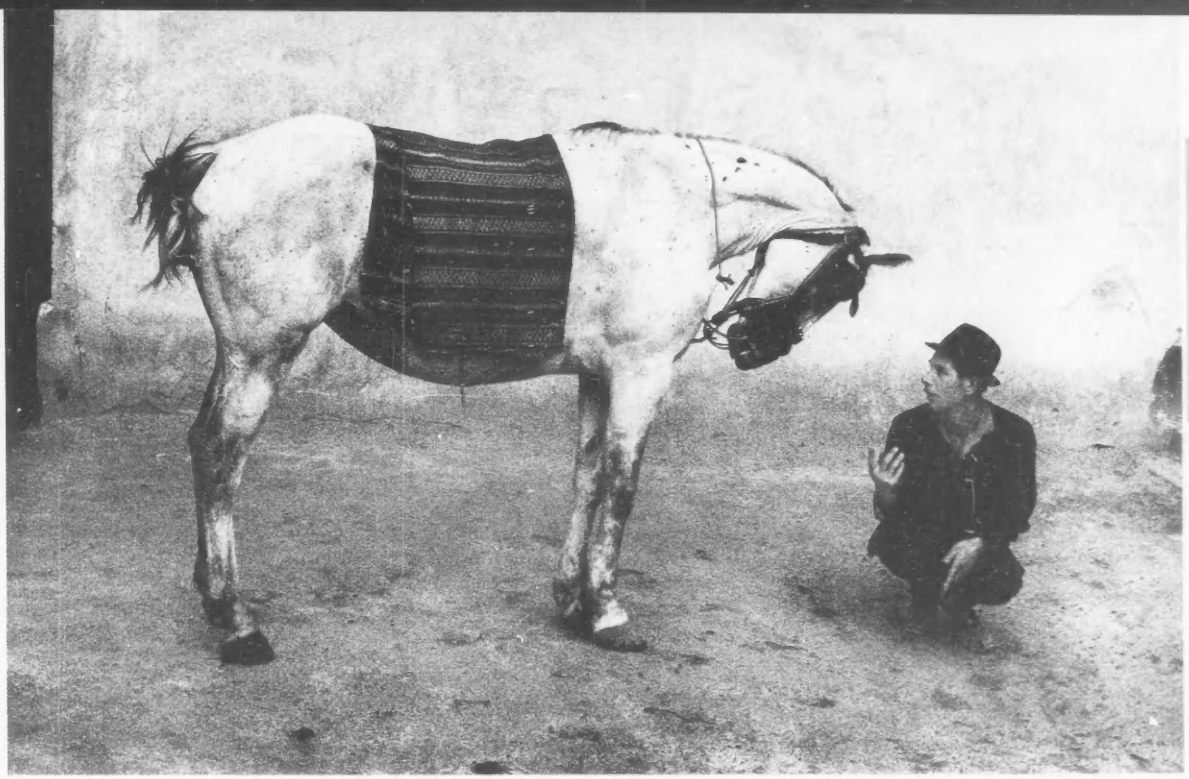


Photo Josef Koudelka © Magnum, Paris

▲ **"For the time being, talking animals—animals capable of holding conversations with people or with each other—must remain the subject of myths and children's literature. ... But one need only observe a shepherd and his dog, or a skilled rider and his horse, to realize the extraordinary level of shared communication which exists." Above, "conversation" between a man and his horse in Romania.**

the rudiments of semantics, or the use of arbitrary symbols to represent objects, states or events. As yet, however, this research has provided little evidence that chimpanzees are able to organize these symbols according to recognizable rules of grammar or syntax. In short, their conversational abilities are strictly limited.

Perhaps because apes lack the ability to pronounce human words, scientists are now exploring the linguistic capacities of other more "talkative" species. Most people assumed that talking birds, such as parrots, merely mimic sounds at random and are incapable of using speech in appropriate contexts—hence the phrase: to learn something "parrot fashion", meaning to imitate things without understanding them.

After several years of careful instruction, however, researchers at one university in the United States have succeeded in training Alex, an African grey parrot, to learn verbal labels for more than twenty different objects, such as paper, rock, cork or water. He also knows five different colours, four different shapes, and various commands, such as "want", "come here", and "you tickle me".

More to the point, Alex is able to combine these words intelligently to identify, request or refuse more than fifty different items, even some which were not included in his original training. Alex is a long way from being able to hold a conversation with his trainers, and many scientists argue that he is just another example of associative learning and the Clever Hans effect. Yet his achievements already rival those of the signing chimpanzees, and Alex is only a parrot.

For the time being, talking animals—animals capable of holding conversations with people or with each other—must remain the subject of myths and children's literature. All our efforts to educate our non-human relations have failed to produce a single individual that is capable of acquiring language. This does not, of course, mean that people and animals are unable to communicate. One need only observe a shepherd and his dog, or a skilled rider and his horse, to realize the extraordinary level of shared communication which exists. But there is a fundamental difference between this, and the kind of communication that goes on all the time between people.

Language, with its abstract symbols and grammatical rules, is apparently unique to human beings. We alone acquire it with ease and apparent spontaneity; so much so that when a person does not acquire language during normal development we are immediately concerned that something is seriously wrong. We need language in order to cope with the complex social and material world in which we live. It is apparent, however, that animals do not need it. They manage their lives efficiently and effectively without.

But, if all this is true, why have people devoted so much time, effort and resources to the idea of talking to animals? What would we actually gain from the exercise? It would certainly be interesting (and doubtless ethically disturbing) to know what animals really think and feel. Or to be able to ask them direct questions concerning their lives. But we have never, in fact, come close to achieving this sort of dialogue. Perhaps our true motive is a simple desire to make contact; to be united once again with our own animal origins.

Human language and self-awareness effectively isolate us from the rest of the animal world. As Adam and Eve discovered, the price of self-knowledge was eviction from the Garden of Eden. Yet in myths, fairy-tales and children's literature, and in our more recent interactions with clever horses, signing chimpanzees and talking parrots, we seem to cherish the persistent, if forlorn, hope that this isolation is only temporary. ■

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Why wildlife matters

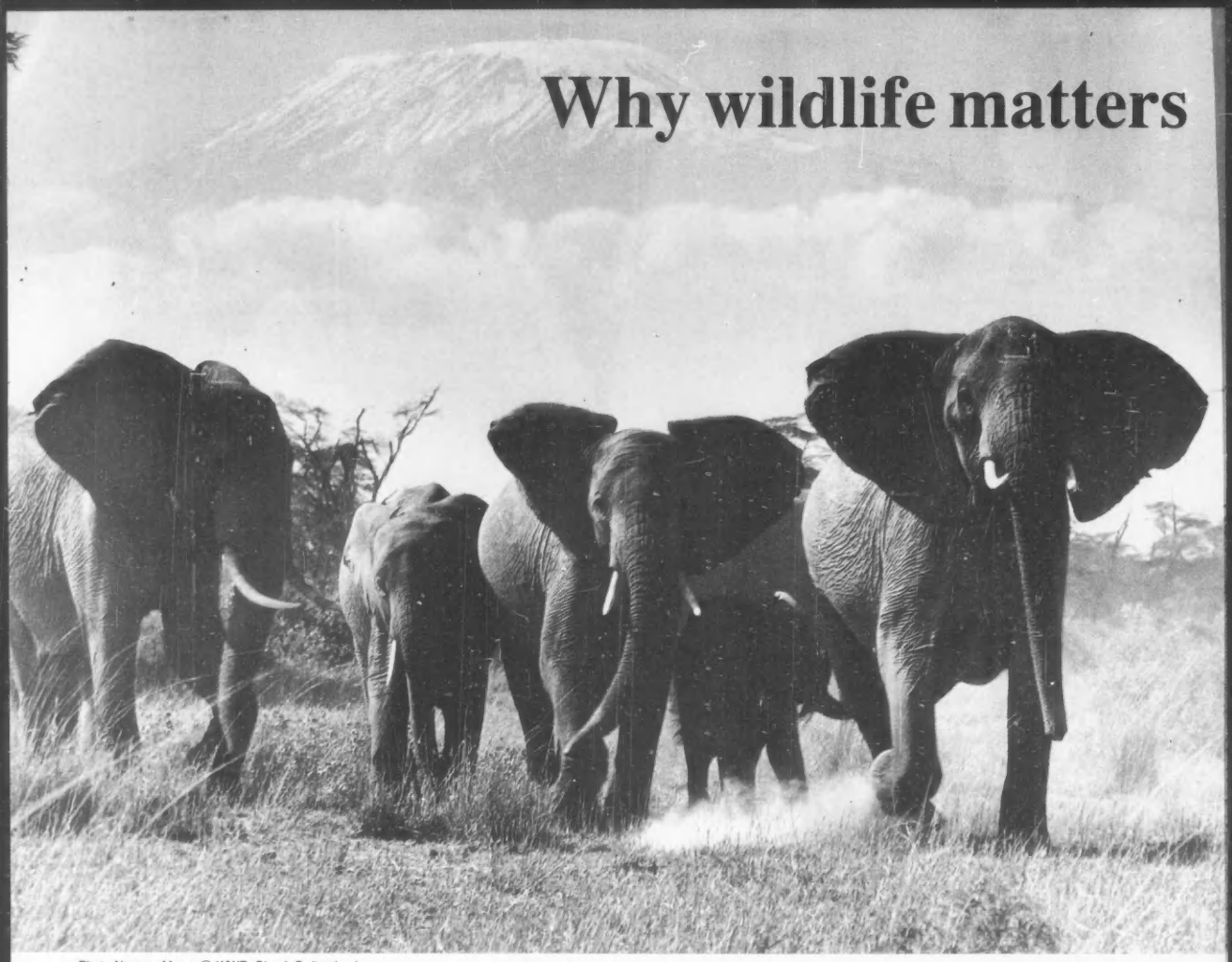


Photo Norman Myers © WWF, Gland, Switzerland

▲
"If all the beasts were gone, men would die from great loneliness of spirit, for whatever happens to the beasts also happens to the man. All things are connected. Whatever befalls the earth befalls the sons of the earth." These words were written by an Indian chief, Seathl, in a letter to the President of the United States in 1855. Above, a herd of African elephants. Poaching for ivory is a serious threat wherever elephants are accessible, and in Africa elephant numbers have declined considerably in recent years.

IN this age of technology, of computers, television, supersonic aircraft and nuclear power stations, why should wild animals and plants matter to us any longer? Surely they must now go into the ash-can of history, along with bows and arrows, wood fires and horse transport?

On the contrary, it is a matter of life and death, in every sense of the phrase, that animals and plants should continue to exist. For every day of our lives, every man, woman and child in the world depends on them for vital parts of their welfare.

Animals and plants contribute to human welfare in three main ways. They provide much of the material basis of human life: almost all our food, much of our clothing, and in many parts of the world still most of the material for building and of the fuel for heating and lighting our dwellings. In addition, they provide the knowledge that is essential for maintaining this material basis, and indeed for preventing a widespread return to more primitive conditions. Not least, they contribute significantly to our enjoyment of our environment, both in our daily recreation and in our wonderment at both the beauty of the natural world and at the mysteries of the universe.

It was recognition of the importance to mankind of the genetic resources represented by animal and plant species, both

by Richard Fitter

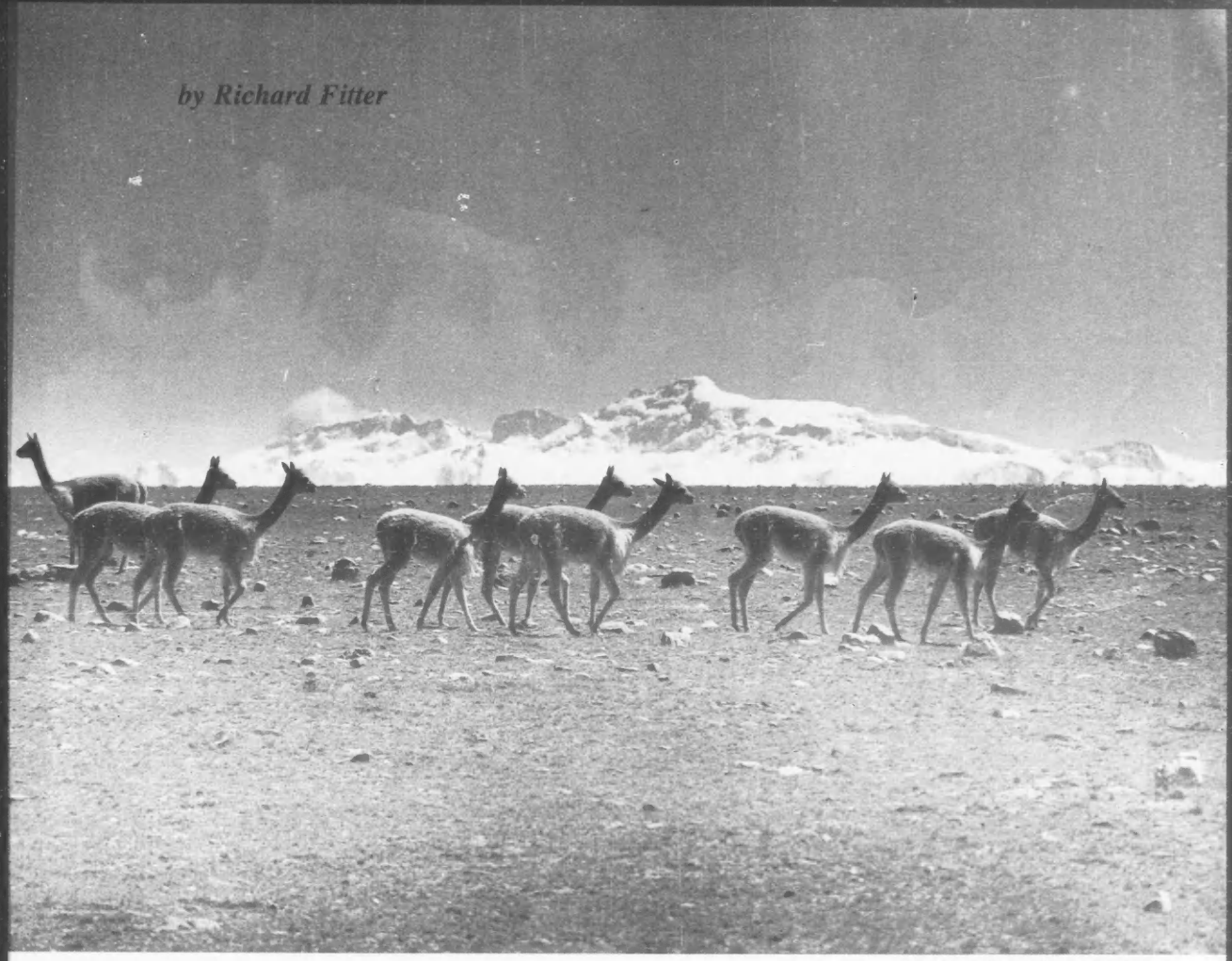


Photo J. Esser © WWF, Gland, Switzerland

▲
The vicuña (*Lama vicugna*), a ruminant related to the llama, lives in the high Andes. Its exceptionally fine and warm wool was highly prized in North America and Europe, and so many vicuña were slaughtered that the species was threatened with extinction until Peru took protective measures to save it in the 1960s.

wild and domesticated, and alarm at their widespread destruction, that eight years ago led the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Wildlife Fund (WWF) to produce the World Conservation Strategy (see the *Unesco Courier,* May 1980). This has three primary objectives:

(1) to maintain viable stocks of all animal and plant species (it must be *all* because we still know so little about the value of the great majority of species; it is only quite recently, for instance, that the value in the treatment of cancer of a little-known Madagascar plant, the periwinkle *Catharanthus,* was discovered);

(2) to maintain large enough stocks of species already known to be of value to man, so that they can be cropped, harvested or otherwise enjoyed indefinitely; and

(3) to maintain pure air and water and fertile soil.

Though all three aims of the World Conservation Strategy are plain common sense, they are widely disregarded by both governments and individuals, thanks to our present social and institutional arrangements. How are we to overcome this widespread neglect and manage the world's animals and plants, both wild and domesticated, on a sustainable basis, i.e. so that they continue to be available for our benefit?

The two main threats to species, which have led to the extinction of some and severe reductions in the numbers of many others, are overexploitation and habitat destruction.

Historically, overexploitation, both legal and illegal, has been the more important. In the last century, overhunting exterminated the passenger pigeon in North America and nearly exterminated the bison there too. In the present century, systematic poaching for their horns and ivory has almost exterminated the black rhinoceros and severely reduced elephant numbers in Africa.

Moreover, overhunting of the great whales, especially in the southern oceans, despite the efforts of the International Whaling Commission (IWC) set up especially to prevent this, has reduced almost all stocks throughout the world to the level of commercial extinction. Since their hunting is now forbidden, the whaling industry has in effect committed suicide. Marine fish stocks throughout the world have also been steadily overexploited so that many of them are no longer available for human consumption. The world's last great reservoir of plentiful fish stocks is now in the Antarctic and sub-Antarctic. Will current efforts through the Antarctic Treaty be too little and too late to save these too?

But today widespread habitat destruction is by far the most serious threat to both animal and plant species, especially in the great rainforest belt of the developing world. Here the burgeoning human population makes constantly increasing demands for timber and cultivable land. "More people and less swamp", as an elderly Floridan pithily explained the decrease of the cougar in his district. Ten hectares of virgin tropical forest are estimated to be disappearing every minute. At this rate of clearance hardly any of the surviving 2 to 3 billion hectares will remain outside national parks and other protected areas by the end of the century, now only a dozen years away.

Pollution is an almost equally important factor. Chemical wastes from both industry and agriculture, as well as from the activities of individuals such as automobile travel, are steadily impairing the quality of

Photo Pierre Letellier © Jacana, Paris

▲ **The African northern white rhino (*Ceratotherium simum cottoni*) lives under threat of extinction because of hunting for its horn. By the early 1980s it was estimated that its numbers had been reduced to fewer than 700 animals. The biggest population of northern white rhinos today live in Zaire's 500,000-hectare Garamba National Park, which in 1980 was included on Unesco's World Heritage List as a natural property of outstanding universal value.**

The Arabian oryx (*Oryx leucoryx*) was once common throughout the desert areas of Arabia, Syria and Mesopotamia. By 1972 it had become extinct in the wild through intensive hunting. Fortunately, before that happened, a few had been captured and used to build up breeding herds. In 1980 the oryx was successfully reintroduced in Oman. ▼

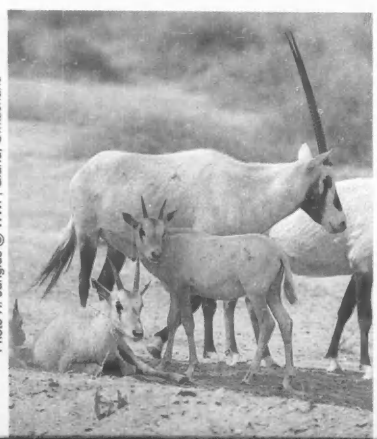


Photo H. Jungius © WWF, Gland, Switzerland

air, soil and water. The most dramatic effect is that of acid rain, due to a "chemical soup" still not fully understood, which is destroying both forests and freshwater fish stocks throughout the northern hemisphere.

To stop overexploitation, we must regulate cropping and harvesting. This calls for both licensing of individual hunters, sometimes with specific bag limits, and quotas for commercial harvesting. The problem is always enforcement, as witness the universal existence and increasing audacity of poachers even in national parks, and the dismal record of the whaling industry.

The accurate estimation of stock size is another problem. The IWC has its own scientific committee to do this for whales, and IUCN has set up a Conservation Monitoring Centre (CMC), to create an accurate data-base for all species. The Centre is also responsible for the Red Data Books, brainchild of Sir Peter Scott, which summarize key information about endangered species.

So far the chief weapon against habitat destruction has been the creation of national parks, nature reserves, wildlife refuges or other protected areas. But can enough land be set aside in this way in the next ten or twelve years to save the many thousands of species that today face certain extinction from rainforest loss alone? The number of species so threatened may indeed be millions, if the latest estimates of the world's invertebrate species—an incredible 30 million—are correct.

The two bodies which bear the brunt of the responsibility for saving species are IUCN and WWF. They share a headquarters in Switzerland and are greatly helped by the United Nations Environment Programme (UNEP), which strongly supports and grant-aids IUCN. Birds are covered by the International Council for Bird Preservation (ICBP), headquartered in the United Kingdom and currently grant-aided by WWF.

IUCN operates through six commissions of scientific experts: the Species Survival Commission (SSC), the one mainly concerned with species conservation, works through a network of more than 90 specialist groups, to which nearly 2,000 zoologists and botanists all over the world voluntarily contribute their expertise. Among the most active groups are those covering African elephants and rhinos, antelopes, cats, primates, crocodiles, marine turtles, dragonflies and orchids. The Trade Group is responsible for IUCN's input into the important Convention on International Trade in Endangered Species (CITES). The SSC also has close links with ICBP, which has its own series of working groups, such as those for parrots, flamingos and bustards.

Two other relevant IUCN commissions are those for Ecology (general habitat problems, pollution) and National Parks and Protected Areas. Unesco's Man and the Biosphere Programme also plays a vital part in preserving habitat for species, as do such international conventions as the World Heritage Convention, and the Ramsar Convention on Wetlands of International Importance.

Many non-governmental organizations belong to IUCN, and some are active in the species conservation field in their own right, notably the Bombay Natural History Society, the Fauna and Flora Preservation

Society of London, the Frankfurt Zoological Society of the Federal Republic of Germany and the New York Zoological Society.

Unlike IUCN, WWF and ICBP operate largely through national organizations or sections, ICBP's network being considerably the more extensive world-wide. WWF is primarily a fund-raising body, and increasingly tends to raise funds for its own programmes and projects.

So where do we go from here? How can this array of national and international bodies help to achieve our aim, the conservation and sustainable use (which includes non-consumptive uses, such as bird-watching and whale-watching) of animal and plant species?

More, and usually a lot more, of what we are already doing seems to be the answer. First we must set aside and manage properly adequate areas of habitat. This includes ensuring that big development projects take account of the need to conserve genetic resources.

We must also ensure that all wild populations that are harvested are not over-harvested. This means both cracking down on poaching everywhere, not just in protected areas, and properly enforcing the CITES trade regulations. Finally, and most important of all, we must carry with us not only the decision-makers, politicians and administrators, but also villagers and townsfolk all over the world. Without their goodwill, and their realization of where their own real long-term interests lie, everything will be lost. ■

RICHARD FITTER, *British naturalist and author, has been a member of the Species Survival Commission of the International Union for Conservation of Nature and Natural Resources (IUCN) for 24 years and is currently chairman of its Steering Committee. His 29th book was* Wildlife for Man, *a source-book on species conservation for the World Conservation Strategy, and his 30th, a field guide to the north-west European countryside in winter, will appear in September 1988.*

Illicit trade in threatened species

THE international wildlife trade, worth billions of dollars annually, has been responsible for massive declines in the numbers of many species of animals and plants. The scale of over-exploitation for trade aroused such concern that an international treaty was drawn up in 1973 to protect wildlife against such over-exploitation and to prevent international trade from threatening species with extinction.

Known as CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora entered into force on 1 July 1975 and now has 96 member countries. Enforcement of CITES is the responsibility of these countries, which are required to ban commercial trade in an agreed list of currently endangered species and regulate and monitor trade in others that might become endangered. Governments are also required to submit reports, including trade records, to the CITES Secretariat in Switzerland.

The wildlife trade involves a wide variety of species, both as live specimens and as products. Millions of live animals and plants are shipped around the world each year to supply the pet trade and to meet the demand for ornamental plants. Furskins, leather, ivory and articles manufactured from these materials are all traded in large quantities.

CITES provides protection for species in two main categories, "most endangered species", and "other species at serious risk". Among those listed in the former category are all apes, lemurs, the giant panda, many South American monkeys, great whales, cheetah, leopards, tigers, Asian elephants, all rhinoceroses, many birds of prey, cranes, pheasants and parrots, all sea turtles, some crocodiles and lizards, and giant salamanders.

Included in the second category are species which might become endangered if trade in them is not controlled and monitored. International trade in these species is permitted with proper documentation issued by the government of the exporting country. The list includes all animal species in the following groups which are not already in the first category: primates, cats, otters, whales, dolphins and porpoises, birds of prey, tortoises, and crocodiles, as well as many other species such as the African elephant, fur seals and birds of paradise.

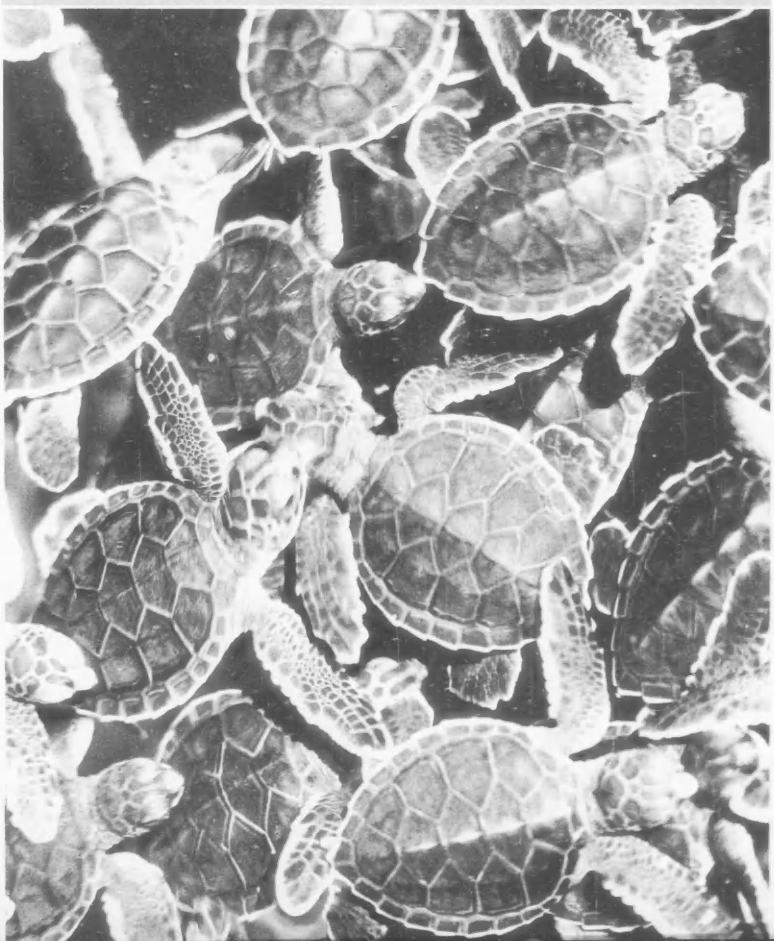


Photo Russ Kinne © Photo Researchers Inc., New York

The green turtle (*Chelonia mydas*), found in tropical seas, is overexploited for its meat, its eggs and its shell, used to make tourist souvenirs. Turtle populations have been severely reduced and in some regions have disappeared completely. Right, baby green turtles.

The wolf—

Photo © All Rights Reserved

a man-made scapegoat

by Daniel Dubois

▲ **Because of its fearsome reputation the wolf has more than once been wrongly accused of crimes it did not commit. When the notorious "Beast of Gévaudan" terrorized part of southern France in the 18th century, claiming over 100 lives and wounding 30 people, an enormous wolf was thought to be the culprit. Today much of the evidence seems to suggest that the atrocities were caused by human hands. Above, contemporary depiction of the Beast of Gévaudan.**

IN the beginning man made a pact with nature. All animals, not only domestic but also those that were thought to be dangerous, were held sacred, and to kill and eat them was regarded as murder and punishable. Save on rare occasions when the whole tribe participated, the use of their flesh was forbidden.

Thus it came about that small groups or clans of men concluded quasi-religious pacts with such animals as the bull, the hare, the lion, the snake, the eagle and the scorpion. The wolf was one of these animals. The clan that chose the wolf made him their totem. He became their brother, their name and emblem, their ancestor, the revered animal which it was forbidden to kill or eat, the tribe's guide and protector who never attacked its members. He was a full member, as it were, and had to respect and share in all the rights and duties of his brother-men.

This fundamental pact or primitive taboo was reflected in a mandatory rule—"thou shalt not kill". This pact applied to men as well as to their brothers the wolves, and it is still observed between the wolves themselves.

Mythology has been described as a dilution of totemism which occurred when man abandoned his pact with nature and transferred his trust to new gods. But in many instances man gave his totem animal to his gods for a companion, or even deified the animal, as in Ancient Egypt, where the wolf was worshipped at Lycopolis, the city of the wolves, capital of the *nome* of Lycopolite, the homeland of Plotinus, now called Assiout. In ancient Greece, Apollo, the god of day and light, was also a wolf-god. A bronze wolf guarded his altar in the temple of Delphi.

Mars-Ares, the Roman god of war, had a wolf for his emblem, and sometimes changed into a wolf by donning a wolfskin. It was his seduction of the vestal virgin Rhea Silvia that led to the creation of Rome. She was punished by drowning and her children, Romulus and Remus, were in danger of certain death in the marshy waters of the Tiber when they were rescued by a she-wolf near Mount Palatine. Later, Romulus killed his brother and built his city on the mountain where the she-wolf had reared them. From that day Rome adopted the wolf as its totem and paraded its famous standard, decorated with the wolf, throughout the Roman world.

Further north the Scandinavian wolf-god Odin (Wotan to the Germans) reigned, assisted by the wolves Gere and Freke, who never left his side. There is no trace of fear of the wolf in any of these legends—at the most a kind of respect. It could not have been otherwise, since the wolf was man's brother and often his protector.

Some Christian saints, especially hermits, lived without fear amongst the animals of the forest. Examples of wolf-loving saints abound, but we shall mention only a few. Among the Slavs there was a tradition that Saint Peter was the wolves' shepherd and that on 17 January he assembled them all and distributed food supplies to them for the coming year. In eastern Europe, Saint George, patron of wild beasts, was accompanied by wolves who were called his hounds and were his favourite companions. The blind Saint Hervé had a faithful wolf to guide him. Saint Francis of Assisi made a friendship pact with the wolf of Gubbio. The pact was respected, and thanks to it the reformed wolf was fed by the people of Gubbio for the rest of his life.

Then, suddenly, everything changed. From being a god or companion of the gods, a friend or familiar animal of the saints, the wolf gradually became a despised and hated beast, an evil animal earmarked for destruction. He became the enemy and—supreme insult—the Devil; the werewolf, Satan's henchman, Hell's procurer. What is the reason for this hatred, which still survives in our subconscious, even though the wolf is now only found in fairytales, comic strips, advertisements, and films of the fantastic?

If we do not know exactly what happened, we can at least try to understand the reasons for this turnabout. It is strange that, although prehistoric man accurately represented many animals on the walls of his

Photo J.M. Charles © Rapho, Paris

◀"Wolf man" Werner Freund, a former keeper at Stuttgart Zoo, has bred a pack of 20 wolves in a specially made enclosure at Merzig, in the Saar forest, Fed. Rep. of Germany. He lives among the animals, playing, eating and even sleeping with them.

The wolf has been persecuted unremittingly for centuries and has all but disappeared from many of its former haunts, at least in Western Europe, where only a few isolated specimens continue to lead a precarious existence. Below, a European wolf cub.
▼

Photo Ray Tercafs © Jacana, Paris

cave-dwellings, he very rarely represented the wolf. And yet we know that the wolf existed at that period, since many wolves' remains have been found in deposits of bones. Pierced eyeteeth of wild boars and wolves, probably used as pendants or components of necklaces, have also been found, especially in children's tombs. To the eyeteeth was attributed the power to protect from disease and the evil eye, a power later found in magic and popular medicine. Clearly, therefore, our hunter-gatherer ancestors were not afraid of the wolf.

The transition to livestock rearing and agriculture brought man and wolf—who occupied the same territories and had similar modes of behaviour—into deadly confrontation. The wolf fell victim to steppe and forest clearances, and, driven into smaller and smaller areas where prey became ever scarcer, he became dependent on man for his survival. In the West he chiefly attacked livestock, an abundant and easy prey. Sometimes hunger or rabies forced him to emerge from his lair and attack his persecutor, man. Hence the hatred and fear, sharpened further by wars, invasion and famines.

Henceforth the two enemies waged an unceasing war on each other in which man spared no effort as a hunter, setting traps and snares, and using poisons and all kinds of weapon. At a very early date man decided to exterminate the wolf because of the wolf's damaging effect on the economy. No account was taken of the wolf's important and necessary ecological role, nor of his role in medicine, for many parts of the wolf have been used in the *materia medica*.

In Western Europe, the Emperor Charlemagne institutionalized the extermination of the wolf when he established the *Louveterie* or wolf-hunt. He had his vassals appoint two officers in each fief, whose duty was to hunt down the wolf. The system was repeatedly modified and finally abolished by Louis XVI on 9 August 1787 as an economy measure.

Napoleon I re-established the *Louveterie* and placed it under the supervision of a *Grand Veneur* or Master of the Imperial Hounds. Everywhere, the *Lieutenants de Louveterie* were big landowners. Many of them were members of the nobility and played an important role in local politics. It was not until 1971 that this legalized survival of feudalism was finally abolished by an act of parliament.

The wolf is now totally extinct in Ireland, the United Kingdom, France, Belgium, The Netherlands, Denmark, the Federal Republic of Germany, the German Democratic Republic, Switzerland, Austria and Hungary. The species is virtually extinct in Norway, Sweden and Finland and is endangered in Bulgaria, Czechoslovakia, Italy, Poland, Portugal and Spain. Today it is only in the snow-bound wastes of Alaska, Canada and the USSR that the wolf is at home.

Has fear of the wolf—or rather the wolf psychosis—disappeared? Whenever a strange, ferocious animal is mentioned, someone will bring up the wolf and his misdeeds, his ferocity, cruelty and man-eating proclivities. During the Middle Ages this fear was nurtured by tales of fantasy told around the fire on long winter nights, and later in cheap news-sheets which seized upon accidents and attacks by wild animals; as well as by the civil and religious authorities.

Nowadays the wolf seems to have lost his power to frighten, and soon fear of the wolf will be only a myth, perhaps less because of his disappearance than because we have acquired a better understanding of his behaviour. ■

DANIEL DUBOIS, *French ethnozoologist, is a staff member of the laboratory of ethnobiology and biogeography at the Natural History Museum, Paris. He is co-author, with Daniel Bernard, of* L'homme et le loup *(2nd edition, 1987) and has published articles in a number of periodicals. He is currently working on a book about people and trees.*

Helping an endangered species to survive in its natural habitat

Photo G.B. Schaller, © WWF, Gland, Switzerland

The last refuge of the giant panda

by Pan Wenshi

GIANT pandas, with their unique black and white fur and adorably clumsy behaviour, are today an endangered species whose fate is worthy of general concern, for they are a treasure not just of China but of the whole world.

Though the origins and taxonomical details of the giant panda are still being debated, its evolution has been clearly defined after scientific study of fossils unearthed at hundreds of spots in China, eastern Burma and northern Viet Nam.

The giant panda already existed three million years before the anthropoid apes evolved into humans. At that time there was only a small number of them living in what is now South China's tropical and sub-tropical jungle where the giant apes ruled. Judging from the fossilized teeth of the giant pandas in those times, their diet was almost the same as it is today, but their average size was only half that of a grown panda today.

Some 750,000 years ago, giant pandas began to spread northward, over the Qinling Mountains which extend across the western half of China, all the way from the Pearl River and the Yangtze River basins in the south to Zhoukoudian in the mountains southwest of Beijing in the north. It was at this time that the giant panda population reached its peak. The pandas also grew in size, averaging about one-eighth bigger than those of today.

In this early period of their evolution, they not only flourished in the tropical and sub-tropical jungles of the south, but also adapted to the mild-to-cool climate of the northern forests.

The giant pandas suffered their first setback some 18,000 years ago when the last Ice Age began. Their kingdom north of the Qinling Mountains was swept out of existence while their numbers in the south dwindled. The real knock-out blow, however, did not come from nature, but from the most intelligent of all living creatures—human beings.

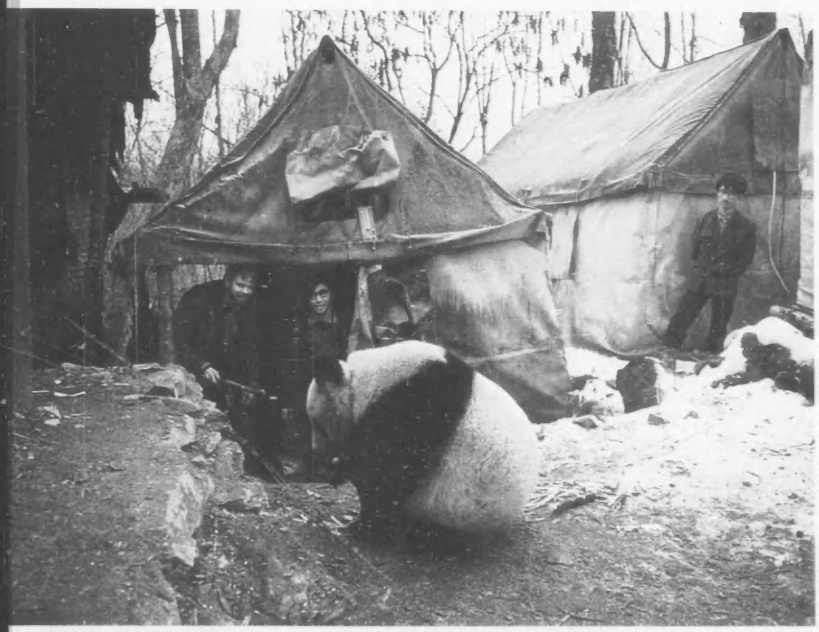
The fast-growing human race in the last few millennia has slowly but irresistibly forced the giant pandas to retreat from the fertile land in the lower mountains of southern China into the deep valleys on the eastern skirt of the Qinghai-Tibet plateau.

Today, giant pandas are found only in six separate locations in the mountainous west of China. In one of these locations, an area of some 1,650 square kilometres on the southern slopes of the Qinling Mountains, are no more than 240 giant pandas. The largest of the six locations, in which some 350 pandas live, spreads out over 13,300 square kilometres of slopes on the Minshan Mountain on the border of Gansu and Sichuan provinces. The now-famous Wolong Nature Reserve, surrounded by the Qionglai Mountains in Sichuan Province, accommodates about 250 giant pandas over an area of 10,425 square kilometres. The southern limit of the giant pandas' living space is along the three mountain chains of Daxiangling, Xiaoxiangling and Daliangshan, where some 100 of the rare animals hide in bamboo thickets scattered over an area of 3,300 square kilometres. All told, there are now less than 1,000 giant pandas in a combined area of 28,725 square kilometres.

▲ **Only about one thousand giant pandas today survive in nature, all in 6 small blocks of high bamboo forest in western China. The panda exists almost entirely on a diet of bamboo.**

How have the giant pandas managed to survive so far? Scientists from Beijing University have reached the following conclusions after studying the natural history of the giant pandas living in the Qinling Mountains.

In their hard-earned coexistence with the human world over thousands of years, the giant pandas have improved their capacity



Photos G.B. Schaller © WWF, Gland, Switzerland

▲
Zhen-Zhen ("precious" or "rare treasure"), an elderly female panda, shows no fear as she visits the panda studies centre established in the Wolong Nature Reserve (Sichuan Province) by the Chinese Ministry of Forestry and the World Wildlife Fund.

to endure the environmental changes brought about by human civilization. But as the changes became quicker and more radical, the giant pandas could no longer keep up the pace and were eliminated in large numbers. However, there were times when civilization affected the natural environment less dramatically, and the giant pandas were thus able to survive. An example of this can be found on the southern slopes of the Qinling Mountains.

Over 2,000 years of attempts to cultivate the mountain slopes have yielded practically nothing because of the harsh climate at such a high altitude. This natural barrier protected the giant pandas from human interference, because people stayed in the warm temperate and sub-tropical areas below 1,400 metres. The temperate and cold temperate forest climate above that height has therefore become the last shelter for the Qinling giant pandas.

Unfortunately, however, the giant pandas are being deprived of their last natural habitat as a result of irrational deforestation prompted by the pressing needs of 1,000 million people. Today the giant pandas of China are threatened with extinction. The shrinking forests, the increasing failure of the animals to multiply because of close-kin mating within separate small groups and the widespread starvation caused by the periodic flowering of the bamboo which forms their diet and which dies after blossoming—all these factors have worsened the giant pandas' already serious plight.

Nature can no longer keep the giant pandas alive. It is up to us to help them to survive. Since China is the only country in the world where giant pandas live in the wild, the Chinese Government has taken strict measures to protect them and is doing all it can through legal protection and educational programmes to help people to realize the importance of helping these endangered animals.

Nature reserves have been declared in 20 per cent of the areas where giant pandas live. A panda studies centre was jointly established by the Chinese Ministry of Forestry and the World Wildlife Fund in 1980. Located in the Wolong Nature Reserve, the centre has carried out comprehensive studies into the life of the giant pandas and worked out measures to protect them in their natural habitats.

In 1984, scientists from Beijing University made detailed observations in the Qinling Nature Reserve, hoping to find a way of creating an ideal forest community that would not only provide the giant pandas with a comfortable living environment but also yield more timber. They hope that their work will help to ease the discord between the giant panda and man and point the way to harmonious coexistence in the future.■

PAN WENSHI, *of the People's Republic of China, teaches biology at Beijing University. He is the author of many studies on the giant panda, including a forthcoming book about the natural habitats of the giant pandas of the Qinling Mountains.*

The monkey and the leopard

An African folk tale

Africa is a mine of proverbs and folk tales which were transmitted from generation to generation by word of mouth at village gatherings. Many of these stories feature animals and communicate a message which is expressed with humour and eloquence. "The repertoire of folk tales seems to be ... a kind of 'unwritten Bible' bequeathed to posterity by the ancestors," notes the Cameroonian writer Gabriel Evouna Mfomo, a specialist in his country's oral tradition. The following story has been taken from *Soirées au village* ("Village Evenings"), an anthology of Cameroonian tales collected and translated into French by Gabriel Evouna Mfomo (Karthala publishers, Paris, 1980).

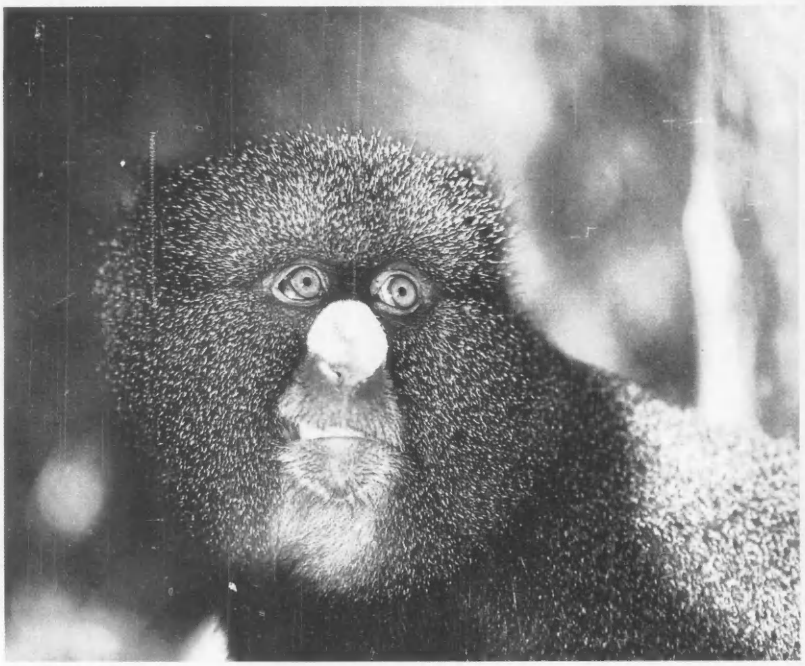


Photo A.B.Y. © Jacana, Paris

ONE day the leopard set out on a hunting expedition. He was very hungry, because for many nights he had not tasted so much as a mouthful of game. He padded softly through the forest, his eyes glaring, his tail between his legs and his tongue hanging out. Suddenly he fell into a pit carefully covered with dead leaves, which was used as a trap. He was dumbfounded, and did not know what to do. Should he cry out? But if he did, he would hasten the arrival of the hunter, who would bear him afar off and come to dispatch him. He thrashed around in the bottom of the pit, springing from one side to the other. But there was no way out!

Breathless with trying, he began to howl. For, as he said: "Can I die in silence when I have a voice to shout for help? Who knows? Perhaps a brother from the tribe of quadrupeds will hear me and come to rescue me."

On the contrary! As soon as an animal saw the leopard at the bottom of the pit, it ran away as fast as it could, saying "What! The leopard? Who can come anywhere near him without risking his life? Let him find his own solution: we all have our own problems!"

The quadrupeds passed by in single file, avoiding the trap: the leopard was left to his fate in the hole.

Meanwhile, Ahem-koé, the white-nosed monkey, was sitting on a branch of an umbrella tree, partaking of a golden fruit and pulling faces as he did so. He heard the leopard's lamentations. He leaned forward and peered into the undergrowth, but could not descry the owner of the voice that seemed to be issuing from the bowels of the Earth. The monkey straightened up, lost his balance and let himself fall to a lower level, where he landed in a bush. He listened carefully: real groans were emanating from the pit. He was worried.

"What's the matter now? Who can be groaning like that?"

He alighted on the ground, and what did he see? A leopard, covered in mud from head to tail, groaning at the bottom of the pit.

"O leopard, son of my father, what are you doing there?" asked the monkey.

The leopard spoke.

"O monkey, O son of my father, I entreat you in kinship's name: save me! I am at death's door! Above all, I am afraid of the owner of the trap. If he were to find me here, it would certainly be all up with me. O monkey, my brother, have pity and pull me out of the pit!"

Ahem-koé paused for a moment to think. He was familiar with the leopard's character. He wanted to clear up a suspicion:

"If I pulled you out, wouldn't you be likely to catch me?"

The leopard swore an oath:

"Never! What? Who ever dreamed of doing such a thing?"

The monkey replied:

"Let us be clear about this. If we come to an agreement, you give me your word of honour."

The leopard confirmed:

"I swear it by the ancestors: Have no fear, son of my father. Rescue me."

Still doubtful, the white-nosed monkey wanted to be quite sure:

"Ah, but, leopard! Are you not saying this simply because your life is in danger? Can it really be you who is saying these things? All the animals know how you tend to behave. Have you ever spared an animal's life?"

The leopard swore repeatedly that he would mend his ways. Ahem-koé invoked the wisdom of tradition:

"Our ancestors said: 'Death is easily given.' They added: 'It is easy to treat an illness, but not someone's character, because the character sticks to its owner!'"

The leopard burst into tears. He begged:

"White-nosed monkey, son of my father, try to pull me out of this hole and I swear to you that the clan of the monkeys and the clan of the leopards will form a lifelong alliance!"

The monkey gave in.

"O leopard, you have pledged your word. We shall see!"

Thereupon, he cut a long stick which he laid across the pit. He sat on it and let his tail dangle within the leopard's reach. The leopard grabbed it and, in the twinkling of an eye, he was out of the pit. The monkey was still recovering his breath and was about to ask the leopard how long he had been in the hole when he noticed a sudden change in the attitude of the leopard, who was, indeed, devouring him with his eyes. The monkey trembled inwardly; he began

Photo Verzier © Jacana, Paris

to shake all over. Timidly, he stammered:

"But why, O leopard, are you looking at me like that? Can you never restrain your fury?"

The freed leopard then spoke as follows:

"White-nosed monkey, have you never learned that one person's happiness is another's misery? Have you not learned that the willing horse got the worst of the bargain and has to carry human beings on his back and be beaten by them? As for you, true enough, you pulled me out of the pit. But do you now expect me to starve to death when you are right there in front of me? You have decided to help me: let me eat you, then!"

Ahem-koé found himself face to face with a ferocious carnivore, with glaring eyes, protruding tongue, tail held low, threatening teeth and steely claws. The terror of the forest! "So it is true," thought the little acrobat. "The leopard has decided to gobble me up!" He was still trying desperately to think of some means of escape when the leopard abruptly interrupted his thoughts:

"White-nosed monkey, have you never heard that the lenient never prosper?"

As best he could, the monkey strove to keep the discussion going in the hope of postponing the evil moment. He thought that he was saved when, walking around the trap, a long procession of quadrupeds filed past on their way home. As each one passed by, he explained his dispute with the leopard, hoping for an impartial judgement. But they were afraid of the leopard. After all, was it not preferable that one should die for the sake of them all? The verdict against the monkey was unanimous: they urged him to let himself be eaten by the leopard. The great cat became dangerously impatient and was no longer willing to continue the discussion. He quoted at his victim one last proverb from the wisdom of the ancestors: "Prolixity is a sign of poverty!".

And he was about to spring at the primate when—all of a sudden—along came the tortoise, laden, as always, with his heavy shell. The antagonists called upon him to be their final judge.

"O tortoise, son of my father," began the monkey. "Something unbelievable has happened to me today! I rescued the leopard from the pit, son of my father, this pit that you see here. And he swore not to harm me. But as soon as I had rescued him, he saw me as nothing but a defenceless prey. Please: you at least can give a clear verdict. If I am in the wrong, I will allow myself to be eaten."

The tortoise clapped his hands in astonishment.

"Do you mean to say," he asked the monkey, "that you managed to pull the leopard out of the hole? Impossible! Where did you get the strength?"

"I am not lying," answered the monkey. "Here is the leopard himself. Ask him."

"O leopard," inquired the tortoise. "Is the monkey telling the truth?"

"Of course what he says is true," growled the leopard. "But that is not the point. I am telling the monkey this: I am hungry and I have nothing else to eat!"

The tortoise reassured him:

"You are quite right, son of my father. However, when I investigate a case, I do not like to rely on hearsay; I always prefer to have direct evidence. So this is my point of view. We are all here, the monkey, the leopard and myself. Here, too, are the pit and the stick. Can you show me how you proceeded? On your side, O leopard, you have nothing to fear. The monkey cannot run away. I am here to guard him."

With a bound, the leopard vanished into the pit.

The tortoise called the monkey:

"White-nosed monkey!" he said. "Have you never heard that a carrier of frogs will one day carry a toad? Have you never heard that if you kiss every tree, then one day you will kiss a thorn tree? That if you keep catching flies, then eventually you will catch a bee?"

Safe and sound once more, the monkey made the following pronouncement:

"The leopard is what he is. And Ahem-koé is still Ahem-koé! I shall never regret having helped someone!"

The tortoise turned to the leopard, half-stunned at the bottom of the pit:

"Stay there in peace, son of my father. And never forget this: our character is our salvation; our character is also our downfall!"

Naa, na hm! ■

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Animals in Islam

by Abdelhamid S. Hamdan

Drawing Peter Bridgewater © Thames and Hudson, London

▲ **The *sīmurgh*, a fabulous bird which appears in the allegorical poem *The Conference of the Birds* by the Persian Sūfī mystic Farīd addin 'Attār (d. c. 1220). Drawing is based on a detail from a 15th-century illustrated manuscript of the poem.**

THE two most important nights in the Islamic year are *Laylat al-Qadr* (the night of the determination), when the Qur'an was revealed, and *Laylat al-'Isrā' wa al-Mi'rāj* (the night of the nocturnal journey from Mecca to Jerusalem of Muhammad, the Prophet of Islam, and of his ascension to heaven).

How was this miraculous nocturnal journey from Mecca to Jerusalem accomplished? How could the Prophet have covered the distance so quickly? Many historians and commentators on the Qur'an tell us that on that night the Prophet travelled on an animal called *al-Burāq*, which transported him at such a miraculous speed that "in a single stride it disappeared from view". The commentators refer to this mount as a kind of horse, described as "an animal halfway in size between a mule and a donkey". Some of them add that it was white with a long back and ears. The concept of *al-Burāq* was later developed and given figurative representation. At a later stage it was even given a human face.

Al-Jāhiz (died 869), a noted Arab writer on animals, wrote in his *Kitāb al-Hayawān* ("Book of Animals") that there is something marvellous about a spider because it knows how to spin a web without receiving any training. According to tradition, a spider saved the Prophet Muhammad at a moment of great danger during his *hijrah* (migration) from Mecca to Medina. He had taken refuge in a cave with his travelling companion, Abu Bakr. Perceiving a spider's web at the entrance to the cave, the Qurayshites who were pursuing them abandoned their search because a man could not have entered the cave without destroying the web. The spider is thus mentioned in the Qur'an and lends its name to the 29th *sūrah* (chapter).

In Arabia, the cradle of Islam, certain domestic animals such as the horse, the camel and the goat played an important role in the lives of Muslims, who attributed to them the qualities and defects of men. The cock, for example, was said to be generous, the lizard deceitful, the lion courageous, and the bustard stupid. Moreover, a number of Arab and Turkish tribes bore animal names, such as *Asad* (lion), *Kalb* (dog) or *Quraysh* (shark). Popular superstition attributed magical powers to certain animals which were seen as the embodiment of evil spirits. The metamorphosis of animals into human form occurs both in folk tales of fantasy and among the miracles performed by saints. Some animal species have patron saints who often take the form of the animals they protect.

A number of animals were, and still are, associated with the practice of magic, and many Arab scholars have written at length about how to interpret the appearance of certain animals in dreams. The desert was populated with fabulous animals such as the *ghul* (gorilla), which was also the animal form assumed by *jinn* (spirits) when they wanted to approach human beings.

In pre-Islamic Arabia, *jinn* were the nymphs and satyrs of the desert. They represented that side of nature which was unsubdued and hostile to man. They figured prominently in popular literature, especially in the first part of *The Thousand and One Nights* where they often transform themselves into animals such as monkeys, cats or dogs in order to act in a hostile manner towards human beings.

As for the *ghuls*, although these fabulous animals were capable of constantly changing their guise and appearing to travellers in the most attractive forms, they could always be recognized by their asses' hooves. This ability to change form and colour became proverbial.

Other fabulous animals, mainly birds such as the *'anqā'*, *rukh* ("roc") and *sīmurgh*, frequently appear in folk tales. The *'anqā'*, which resembled the phoenix, was associated with the Ashāb-al-Rass, a pre-Islamic people who fell victim to this bird, which became a scourge. The prophet Hanzala ben Safwān is credited with having put an end to the *'anqā'*s ravages. After the coming of Islam the *'anqā'* was identified with the *sīmurgh*, which plays a role in Iranian mythology.

Animal tales in the folklore of certain parts of the Islamic world, especially in North Africa, form an important part of the oral tradition. The central role is often played by the jackal (*Ibn Āwā*), half wolf, half fox.

Zoology was never a very popular subject with Islamic scientists, and, despite the translation in the 9th century of Aristotle's *Historia animalium* by Yahyā ben al-Bitrīk,

Illustration from a manuscript of *Kalila wa-Dimna*, the Arabic version of a collection of Indian animal stories designed for the education of princes and attributed to Bidpai, a legendary Indian sage. It shows a dialogue between the King and the Bird Fanza in which the King says, "We have betrayed you and you have taken revenge so that we are now even. Come back to us and have no fear." "No," says the Bird. "I will never come back to you." ▶

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قال الملك قد لعمري غدرنا بك فانتقمت منا فليس لك قبلنا ولا لنا قبلك وتر

مطلوب فارجع الينا آمنا قال فنزة لست براجع اليك ابدا فان ذوي الراي

Photo © Bibliothèque Nationale, Paris

it occupies a rather insignificant place in the various theoretical classifications of the sciences. It formed an integral part of the physical and natural sciences, and al-Fārābī associated it with the study of the soul. This is probably largely due to the absence of organized research and specialized works of a genuinely scientific character. The monumental work on animals by al-Jāhiz referred to above is a religious work, not a book on zoology, and it consists largely of literary references enriched by oral traditions. The same can be said of the *Hayāt al-Hayawān* (c. 1371) by ad-Damīrī (died 1405) which does not offer any new classification, merely reproducing that of al-Jāhiz.

Physicians and naturalists were interested in animals, but the only branches of zoology that were thoroughly and systematically studied were hippology, hippiatry and ornithology as applied to the training of falcons for hunting.

Many animal species figure prominently in pre-Islamic Arabic poetry, and camels, horses and other animals continued to be described in Arabic poetry after the coming of Islam. Charming verses were written about domestic animals, especially goats, cats and birds. In later centuries the crow and the lion remained favourite subjects of poetry, the former symbolizing the sadness of separation, the latter strength and audacity—ideas dear to Arabs.

Where prose is concerned, the *Kalila wa Dimna*, an Arabic translation of a collection of Indian animal fables known in Europe as *The Fables of Bidpai*, was a revelation for many people. The original Indian work was intended to teach wisdom to princes by means of fables told through the mouths of animals. This new literary genre enjoyed great popular success, soon became part of the Arab and Islamic literary heritage, and inspired many writers and artists.

Representations of animals are not a prominent feature of art in Islamic countries, because of the aniconic and abstract decoration characteristic of Islamic civilization. Each species is treated differently, in accordance with ideas derived from literature, from daily life, or from their symbolic and magical significance.

As early as the Ummayad period, animal figures were being employed for their decorative qualities and to glorify the reigning power. Animal motifs such as lions and birds of prey appeared frequently on royal furnishings and were used to symbolize royal grandeur.

This taste for animal motifs later became ever more pronounced, reaching its peak in Iran, Iraq, and Egypt, and later in Ottoman Turkey, where scenes from daily life (hunting, animal rearing and training) were frequently portrayed.

Muslim painters and miniaturists also depicted animals, but in quite a different spirit, producing highly stylized interpretations which were not devoid of accuracy or even of realism. ■

ABDELHAMID S. HAMDAN, *Egyptian specialist in the history of Islam, is the author of a number of scientific studies on Islam and is currently editing a series of Arabic manuscripts on history, science and mysticism.*

The constellations of the Centaur and the Lion as shown in *The Book of Fixed Stars*, by 'Abd ar-Rahmān as-Sūfī (903-986). Following ancient Greek tradition, the author represented the constellations by animal or human figures or by objects.
▼

Photo © Bibliothèque Nationale, Paris

The private life of the vampire bat

by Marian Stamp Dawkins

Photo C.V.V. © Jacana, Paris

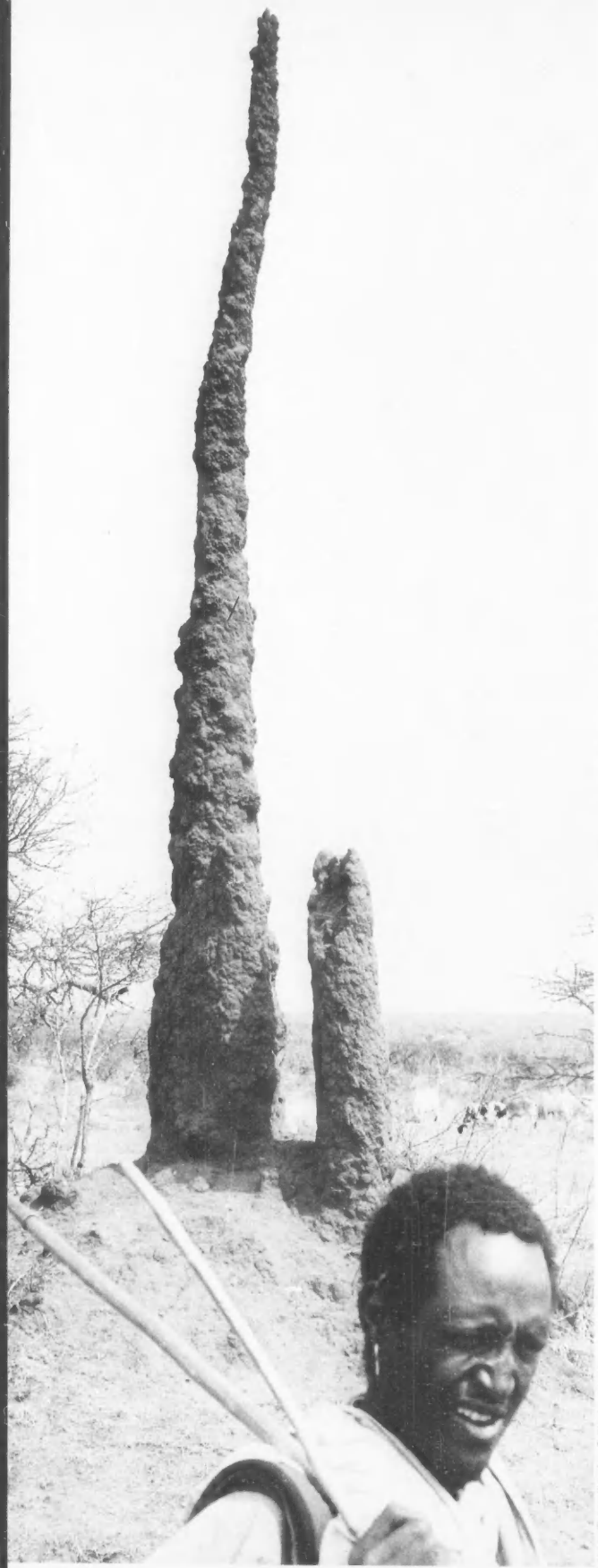
▲
Blood-eating vampire bat of tropical America (*Desmodus rotundus*, actual size 6-9 cm.)

...and other surprising examples of animal behaviour

THERE is a tendency among many of us to think that the human view of the world is the only one. We become so wrapped up in our own concerns that we may fail to notice that there is another point of view. We may think that the suburbs of our towns are divided up into postal districts or sharply delineated by the boundary between our property and our neighbours'. But cats will divide up the same area quite differently and small birds such as great tits see it divided into territories, to be fiercely defended against other great tits, with little regard as to where humans put their arbitrary lines of ownership.

The study of animal behaviour is, perhaps more than any other branch of biology, a window into other worlds, the worlds of species that may be very different from our own, and it has provided some astonishing revelations into the private lives of the animals concerned. Who would have thought that vampire bats would be willing to give each other food when they were in

Continued on page 33



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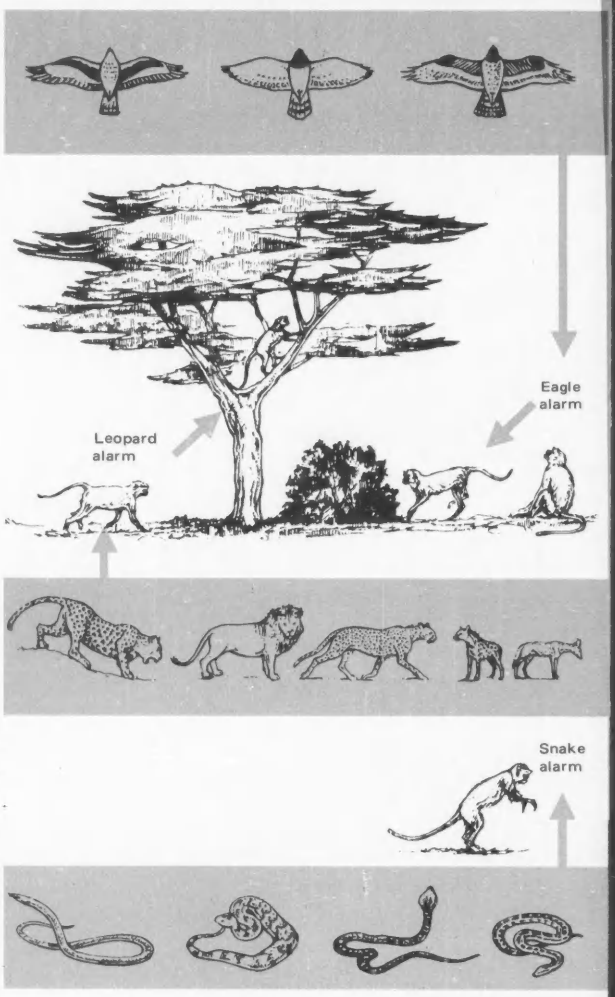

Drawing *Animal Language* Michael Bright © BBC, London

▲ **Study of vervet monkeys in Kenya's Amboseli National Park showed that the monkeys have different alarm calls for their 3 main predators, leopards, eagles and snakes. Each type of call elicits a response appropriate to the kind of predator with which the call is associated. When the monkeys hear a "leopard" call, they run for the nearest trees; an "eagle" call causes them to look up at the sky and head for dense scrub; and a "snake" call has them standing on their hindlegs peering into the long grass around them.**

◀ Termite tower blocks

Termites build brilliantly designed "air-conditioned" nests which provide the climate suited to their needs. The nests begin as underground chambers and swell above ground as the termite population grows, eventually forming a mound up to 6 metres high. The large population means that the air has to be regularly purified. High humidity and temperature are also critical for survival. The termites achieve climate control by an elaborate system of air ducts inside the mound through which body heat and carbon dioxide are filtered to the outside walls and cool fresh air is channelled back to the base.

Photo © Malcolm Newbrick

Continued from page 31

need, and also remember which bat had done them a good turn in the past? But, unlikely though it sounds, G.S. Wilkinson has shown that these bats seem to realize which of their fellows are in danger of starvation and then give them blood meals if they are. There is a catch, however. A bat is more likely to provide food for another one if, in the past, the starving bat has given food to *it*. An unhelpful bat is therefore less likely to get help itself when the need arises.

Just as unexpected were the insights into monkey society that Dorothy Cheney and Robert Seyfarth found when they started watching vervet monkeys in the Amboseli National Park in Kenya. One of the first things they noticed was that the monkeys make different alarm calls depending on what sort of predator they have seen. If one monkey has seen a snake, it warns the others by giving a call that makes them look down onto the ground; if it has seen a leopard, it gives a second sort of call that makes the others run into trees; and if it gives the "eagle alarm" call, the other monkeys look expectantly up into the sky. The monkeys clearly have the ability to "tell" each other what is going on.

More recently, the same workers have shown that vervet monkeys are also connoisseurs of each others' family relationships. A monkey that has recently been in an aggressive interaction with another one is more likely to threaten the kin of that second monkey than before. The monkey apparently notices who are the close associates of the individual that is bothering him and then takes it out on them just because they are members of the same family!

The parallels between a group of animals "talking" to each other about things going on in their environment and having a detailed knowledge of each others' family relationships may be a little too close for comfort to those who like to see a very sharp dividing line between our own species and any other animal. But if there is one thing that the study of animal behaviour teaches us, it is that the dividing line, although it may be there, is not nearly as sharp as we might like to think it is.

One area in which we humans tend to think that we stand quite apart from other animals, for example, is that of choosing a mate. In fact, in farming, dog-breeding and all sorts of other situations, we assume that the animals do not care who they get as a mate just as long as it is the right species and that we can direct them to whatever partner we choose. Our desire for bigger and better bodies or more milk rides roughshod over any preference they might have. And yet when we look at what animals do when left to choose mates on their own, we find that not only are they often extremely fussy, but that their choices, particularly those of females, are based on the most pragmatic considerations of social status and material wealth in their partners.

Female spotted flycatchers (small migratory birds) have a strong preference for males that arrive on the breeding grounds early in the spring and set up their territories before the other males arrive. These early arrivals tend to be the older males so the females are apparently choosing mature, well-established males as their partners. However, by cleverly manipulating the numbers of nest-boxes available in a given area at any one time, R. Alatalo and his colleagues in Sweden were able to show that it was not the male himself the females were going for, but his territory. What the females really wanted was a safe place to nest and this, in their view, meant an area full of tall trees with high nest sites well out of harm's way. If such a territory was defended by an older male, a female would choose him, but if the territory belonged to a younger male, he would do just as well. It

A fox investigates radio tracking apparatus used to study foxes.
▼

Photo © Malcolm Newdick

was the resources and nature of the territory that mattered, not the male himself.

Even more mercenary are the female hanging flies studied by Randy Thornhill in the United States. These females simply will not mate at all unless presented with food. The larger the gift of insect food, the longer the male is allowed to copulate and the more eggs he fertilizes. The transaction is as basic and straightforward as that.

It is clear, even from these few examples, that the lives of many animals are of great complexity and in some ways seem to provide echoes of what we find in human beings. But are we right to draw such parallels and, even if we wanted to, which animals should we look to? Do we look to our closest living relatives, the monkeys and apes? If so, do we see ourselves as baboons with their male dominance hierarchies and harems where the male disciplines his females by biting them on the back of the neck? Or should we look to chimpanzees with their promiscuous, much more egalitarian society based on political alliances between brothers and close relatives? If we really want to draw fruitful analogies, perhaps we should look even further afield. After all, ants are one of the few kinds of animal to go in for organized warfare in the way that humans do.

In view of the enormous range of ways in which different animals run their lives, there are perhaps only two conclusions we can draw with any certainty when we compare animals to humans. The first is that the human view of survival, the choice of mate, the rearing of young and the complexities of social relationships is not the only one. We share this planet with millions of other species whose lives, if we just take the trouble to look into them, are full and rich in their own right. There are other pairs of eyes besides human ones looking out onto our world and knowledge of that fact should surely affect the ways we treat other species and respond to them. It is arrogance indeed to see our own species as the only one of importance and, although it may dent our human pride a little, perhaps we do have to acknowledge that the study of animal behaviour shows up parallels and similarities in areas we might have thought were uniquely human.

The other conclusion is essentially hopeful. Most biologists believe that all animals evolved by the process of natural selection, which, on the face of it, appears to be a ruthlessly selfish struggle for survival. We might expect, therefore, to see "Nature red in tooth and claw", as the fittest struggle to survive and those unsuited to their environments lose out in the competition for life. Instead, what do we find? We find co-operation and collaboration, caring and feeding of others. We find parents looking after young, we find animals warning each other of danger, we find even those hated animals, vampire bats, feeding each other when one of their number is in danger of starvation. From the essentially selfish struggle to survive and reproduce has evolved co-operation and mutual aid because these, in the long run, give both parties an advantage.

For many animals, to belong to a group that aids them or feeds them when they are in need gives them a better chance in life than leading a solitary existence, even though group membership may be at the price of sometimes giving aid and protection to others in return. Co-operation can pay off. It may be co-operation born of self-interest, but it is co-operation nevertheless. Surely our own species, troubled with conflict and competition, can take some comfort in that. ■

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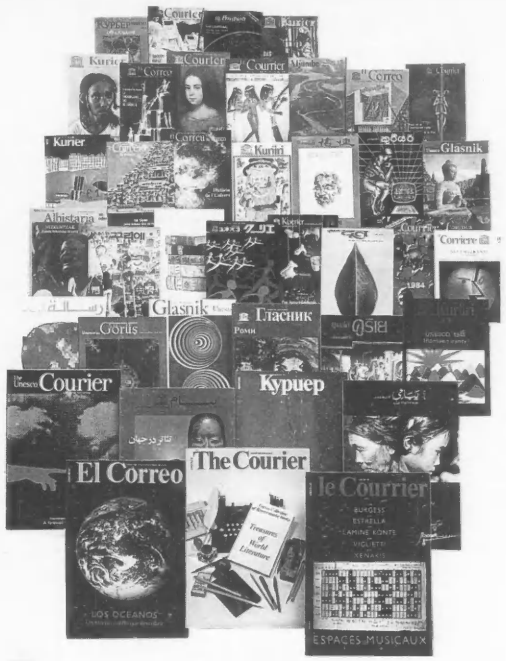

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Mohammed-V, Rabat; Librairie des écoles, 12 ave, Hassan-II, Casaglanca; Société cherifienne de distribution et de presse, SOCHEPRESS, angle rues de Dinant et St. Saëns, BP 13683, Casablanca 05. **MOZAMBIQUE.** Instituto National do Livro e do Disco (INLD), avenida 24 de Julho, 1921 r / d 1º andar, Maputo. **NEPAL.** Sajha Prakashan Polchowk, Kathmandu. **NETHERLANDS.** *Books only:* Keesing, Boeken B.V., Hogehilweg 13, Postbus 1118, 1000 BC Amsterdam. *Periodicals:* Faxon Europe, P.O. Box 197, 1000 AD Amsterdam. **NETHERLANDS ANTILLES.** Van Dorp-Eddine N.V., PO Box 200, Willemstad, Curaçao, NA. **NEW ZEALAND.** Government Publishing, P.O. Box 14277-Kilbirnie, Wellington. **NIGERIA.** The University Bookshop of Ife; The University Bookshop of Ibadan, P.O. 286; The University Bookshop of Nsukka; The University Bookshop of Lagos; The Ahmadu Bello University Bookshop of Zaria. **NORWAY.** Johan Grundt Tanum, P.O.B. 1177 Sentrum - Oslo 1; Universitets Bokhandelen, Universitetssentret, Postboks 307 Blindern, Oslo 3; *Periodicals only:* Narvesen A/S, Litteraturt Jenesten, P.O.B. 6125 Etterstad, N 0602 Oslo 6. **PAKISTAN.** Mirza Book Agency, 65 Shahrah Quaid-i-azam, P.O. Box No. 729, Lahore 3; Unesco Publications Centre, Regional Office for Book Development in Asia and the Pacific, 39 Delhi Housing Society, P.O. 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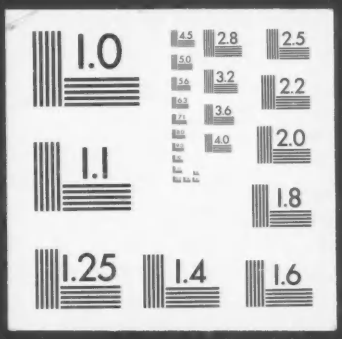
Hovbokhandel, Regeringsgatan 12, Box 16356, S-103 27 Stockholm 16; *For the Unesco Courier:* Svenska FN Förbundet, Skolgrand 2, Box 150 50 S-104, 65 Stockholm; *For periodicals only:* Wennergren-Williams AB, Nordenflychtsvagen 70, S-104, 25 Stockholm; Esselte Tidskriftscentralen, Gamla Brogatan 26, Box 62 -101, 20 Stockholm. **SWITZERLAND.** Europa Verlag, 5 Ramistrasse, Zürich; Librairies Payot in Geneva Lausanne, Basle, Berne, Vevey, Montreux, Neuchâtel and Zürich. **SYRIA.** Aleppo University Books Establishment, University of Aleppo, Aleppo. **TANZANIA.** Dar-es-Salaam Bookshop, P.O.B. 9030, Dar-es-Salaam. **THAILAND.** Nibondh and Co. Ltd., 40-42 Charoen Krung Road, Siyaeg Phaya Sri, P.O. Box 402, Bangkok; Suksapan Panit, Mansion 9, Rajdamnern Ave., Bangkok; Suksit Siam Company, 1715 Rama IV Road, Bangkok; ROEAP, PO Box 1425, Bangkok 10500. **TRINIDAD AND TOBAGO.** National Commission for Unesco, 18 Alexandra St., St. Clair, Port-of-Spain. **TURKEY.** Haset Kitapevi A.S., Istiklâl Caddesi, No 469, Posta Kutusu 219, Beyoglu, Istanbul. **UGANDA.** Uganda Bookshop, PO Box 7145, Kampala. **UNITED ARAB EMIRATES.** Maktabat al Markazia, PO Box 13408, Al Ain, Abu Dhabi. **UNITED KINGDOM.** H.M. Stationery Office, PO Box 276, London, SW8 5DT; H.M.S.O. Bookshops in London, Edinburgh, Belfast, Manchester, Birmingham, Bristol; Third World Publications, 151 Stratford Road, Birmingham B11 1RD; *for scientific maps only:* McCarta Ltd., 122 King's Cross Rd., London WC1X 9DS. **UNITED STATES OF AMERICA.** Bernan-UNIPUB, Periodicals Department, 4611-F Assembly Drive, Lanham, MD 20706 4391. **URUGUAY.** Ediciones Trecho, S.A., Maldonado 1092, Montevideo. **USSR.** V/O Mezhdunarodnaya Kniga, Ul. Dimitrova 39, Moskva 113095. **YUGOSLAVIA.** Mladost, Ilica 30/11, Zagreb; Cankarjeva Zalozba, Zopitarjeva 2, Lubljana; Nolit, Terazije 13 / VIII, 11000 Belgrade; *periodicals only:* Jugosolvena Kniga, PO Box 36, YU 11001 Belgrade. **ZAMBIA.** National Educational Distribution Co. of Zambia Ltd., P.O. Box 2664, Lusaka. **ZIMBABWE.** Textbook Sales (PVT) Ltd., 1 Norwich Union Centre, Harare.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